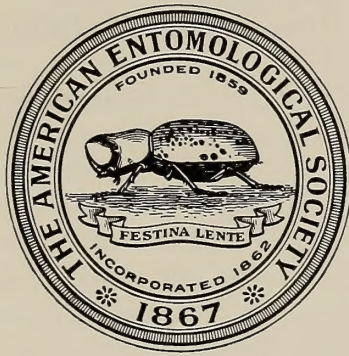


MEMOIRS
OF THE
AMERICAN ENTOMOLOGICAL SOCIETY
NUMBER 20

A REVISION OF THE MEXICAN
AND CENTRAL AMERICAN SPIDER
WASPS OF THE SUBFAMILY
POMPILINAE
(HYMENOPTERA: POMPIDIDAE)

BY

HOWARD E. EVANS



PUBLISHED BY THE AMERICAN ENTOMOLOGICAL SOCIETY
AT THE ACADEMY OF NATURAL SCIENCES
PHILADELPHIA

1966

HAROLD J. GRANT, JR.

EDITOR

(Issued March 15, 1966)

PRINTED IN THE UNITED STATES OF AMERICA

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(HYMENOPTERA: POMPILIDAE)¹

BY HOWARD E. EVANS

Museum of Comparative Zoology, Cambridge, Massachusetts

INTRODUCTION

One of the more frustrating aspects of taxonomic studies is that they must usually, for practical reasons, concern themselves with one particular geographic area. Sound world revisions represent the ultimate in taxonomy, but even the most idealistic of taxonomists is sooner or later discouraged by the impossibility of obtaining enough material from certain areas, the difficulty of locating and studying all the necessary types, and so forth. This of course does not justify all the provincialism in taxonomy that actually exists: there is far too much of it. It does, I hope, justify a revision such as this one, an attempt to fill in more clearly a small part of a very large picture.

One result of the regional approach to taxonomy is that species, and even genera, may be called by different names in different parts

¹ A major part of the cost of publication of this paper was defrayed by a publication grant from the John Simon Guggenheim Memorial Foundation, which also supported my research in Mexico in 1959. Additional publication funds were provided by the William Morton Wheeler fund of the Museum of Comparative Zoology.

of their range. This is so common in insects that most working taxonomists can think of dozens of examples only recently corrected or still uncorrected. It goes without saying that this situation is hardly conducive to worthwhile considerations of evolution or zoogeography, to say nothing of its practical disadvantages.

The Pompilidae of America north of Mexico have recently received a fairly thorough revision (Townes, Hurd, Bradley, and Evans have each done a portion of the family). This does not mean that no problems remain; but at least one can safely say that the Nearctic fauna of this family is better known than that of any other region. However, these workers have either omitted the fauna of Mexico and Central America or included only a smattering of records — though all would admit this was more of necessity than of desire. Less than half of the genera and subgenera of spider wasps of North America are Holarctic in their distribution patterns; the remainder are either intrusions from South America or are centered in the Sonoran sub-region, largely in Mexico. Hence it is impossible to arrive at a sound understanding of the Nearctic fauna until we have a more complete knowledge of the Mexican and Central American species.

Mexico and Central America are poorly collected as compared, for example, to the eastern United States. Nevertheless enough material has accumulated in museums in the last decade or two to make such a project possible. With the aid of a grant from the Permanent Science Fund of the American Academy of Arts and Sciences, I have been able to study the material described in the *Biologia Centrali-Americana*, including the many types of Peter Cameron and of Fred-eric Smith. A trip to Mexico in the summer of 1951 was supported by the American Philosophical Society, another in the spring and summer of 1959 by the John Simon Guggenheim Memorial Foundation. A short trip to Mexico in the summer of 1962 and one to Costa Rica in February 1964 were supported by the National Science Foundation in connection with other research projects. I have studied the material collected by the 1947 David Rockefeller Expedition of the American Museum of Natural History and by various expeditions to Mexico sponsored by the University of California and the University of Kansas. H. A. Scullen of Oregon State University, and R. R. Dreisbach, of Midland, Michigan, have provided me with valu-

able material which they collected in Mexico. Material collected by Carl W. Rettenmeyer on Barro Colorado Island, Panama, and now at the University of Kansas, and material collected by Kenneth W. Cooper in Costa Rica, now at the U. S. National Museum, has proved especially valuable. I have tried to include in this study all available material in museums in the United States and in Mexico. The following is a list of these institutions and the abbreviations by which they are designated in the text.

ANSP: Academy of Natural Sciences of Philadelphia
 AMNH: American Museum of Natural History, New York
 BMNH: British Museum (Natural History), London
 CAS: California Academy of Sciences, San Francisco
 CIS: California Insect Survey, Berkeley
 CM: Carnegie Museum, Pittsburgh
 CNC: Canadian National Collections, Ottawa
 CU: Cornell University, Ithaca, N. Y.
 ENAC: Escuela Nacional de Agricultura, Chapingo, Mexico
 KSU: Kansas State University, Manhattan
 KU: Kansas University, Lawrence
 LACM: Los Angeles County Museum
 MCZ: Museum of Comparative Zoology, Cambridge, Mass.
 MSU: Michigan State University, East Lansing
 OSU: Oregon State University, Corvallis
 UA: University of Arizona, Tucson
 UCD: University of California, Davis
 USNM: United States National Museum, Washington

Since a large proportion of the material collected in Mexico and Central America in recent years has been taken by a relatively small number of collectors, I have found it convenient to abbreviate the names of some of them. The following is a list of abbreviations employed, arranged alphabetically according to the first letter of the abbreviation.

| | |
|-------------------------|------------------------|
| AEM: A. E. Michelbacher | CM: C. MacNeil |
| AM: Arnold Menke | CWR: C. W. Rettenmeyer |
| CCP: C. C. Porter | CY: Carl Yoshimoto |
| CDM: C. D. Michener | EG: E. Gilbert |

| | |
|---------------------------|----------------------|
| EIS: E. I. Schlinger | JWM: J. W. MacSwain |
| ESR: E. S. Ross | KWC: K. W. Cooper |
| FDP: F. D. Parker | LS: Lionel Stange |
| FPM: Francisco Pacheco M. | MC: Mont Cazier |
| FXW: F. X. Williams | NB: Nathan Banks |
| GCC: G. C. Champion | PDH: P. D. Hurd, Jr. |
| GEB: G. E. Bohart | RCB: R. C. Bechtel |
| HBL: H. B. Leech | RFS: R. F. Smith |
| HEE: H. E. Evans | RHP: R. H. Painter |
| HHS: H. H. Smith | RRD: R. R. Dreisbach |
| JB: Joseph Bequaert | WG: Willis Gertsch |
| JP: Jerry Powell | |

The terminology here employed is that established by myself and by Bradley in our revisionary studies. For the sake of brevity, the following standard abbreviations have been used.

- HE: height of eye (maximum, lateral view)
- LID: lower interocular distance (minimum distance between eyes near their bottoms)
- MID: middle interocular distance (distance between eyes near the middle, at the greatest emargination of the inner orbits)
- OOL: ocello-ocular line (distance from a lateral ocellus to nearest eye margin)
- POL: postocellar line (distance between posterior ocelli, not including the ocelli themselves)
- S: sternite of the abdomen (i.e., the gaster or metasoma)
- SGP: subgenital plate of male (i.e., apical sternite)
- SMC: submarginal cell of fore wing
- T: tergite of abdomen (i.e., the gaster or metasoma)
- TFD: transfacial distance (greatest width of head in anterior view)
- UID: upper interocular distance (minimum distance between eyes at their tops)
- VFD: vertical facial distance (medial height of head in full frontal view, exclusive of labrum and other mouthparts)

Keys and descriptions are provided for all species of Pompilinae known to occur in Mexico and Central America, and for occasional

species occurring in neighboring areas. Two types of descriptions are employed: (1) a relatively detailed description of the type, in cases of new species or those which have been poorly known or misunderstood; or (2) a brief description of the more diagnostic features, in the case of species recently covered by Bradley or myself in greater detail. Descriptions of the second type are not usually accompanied by illustrations, but references are given to published figures. Significant variation in color and structure is summarized following the distributional data for each species.

The matter of when to employ subspecific names is a difficult one in this group as in many other groups of wasps. In the past there was a tendency to describe any striking variant as a "variety", but since the International Rules of Nomenclature recognize only one infraspecific taxon, the subspecies, most of these varieties have been either ranked as subspecies or discarded. Most of those which have been preserved are based on only one or two characters, usually involving color of the integument or of the pubescence. The retention of some of these subspecific names can be defended on the basis of utility and tradition even though they are decidedly "weak" subspecies zoologically. My criterion for recognizing or not recognizing a given subspecies is therefore a simple and largely non-zoological one: if a name is well established for a population which differs in at least one striking character present in one sex from a neighboring population, I recognize the subspecific name. The existence of intergrades in a zone of overlap can be taken to support subspecific status for two allopatric forms, but I know of at least two instances in the Pompilidae where forms which are sufficiently different to justify specific status are known to hybridize where their largely separate ranges overlap (*Pepsis elegans* and *cerberus*, *Psorthaspis portiae* and *formosa*).

The important task is to define the species and those strongly differentiated subspecies which seem of nearly specific status (and which may, as a matter of fact, represent closely related allopatric species). How one wishes to describe the variation within these distinctive populations will depend partly on individual preference, partly on how important this variation is from the point of view of identification and from the point of view of understanding speciation,

adaptation, and distribution in that complex. Studies on more sophisticated levels should surely attempt to analyze all evident variation and to plot it geographically. However, because of the broad scope of the present studies and because many of the species are new or poorly understood, my discussions of variation have mostly been brief and relatively superficial. I have described no new subspecies except where they could be clearly defined in both sexes and where they seemed not far removed from specific status.

COMPOSITION OF THE MEXICAN AND CENTRAL AMERICAN POMPILINE FAUNA

The limits of the present study are clearly arbitrary, for no animals other than man respect the Mexico-U.S. border or the Panama-Colombian border. The reader will find, however, that my studies have splashed over these political boundaries considerably, in fact nearly as freely as the wasps themselves have violated them. Of and by itself, the wasp fauna of Mexico and Central America is of rather minor interest, there being but few endemics restricted to this area. But as an avenue of dispersal between North and South America and into the West Indies, this area is of very great interest.

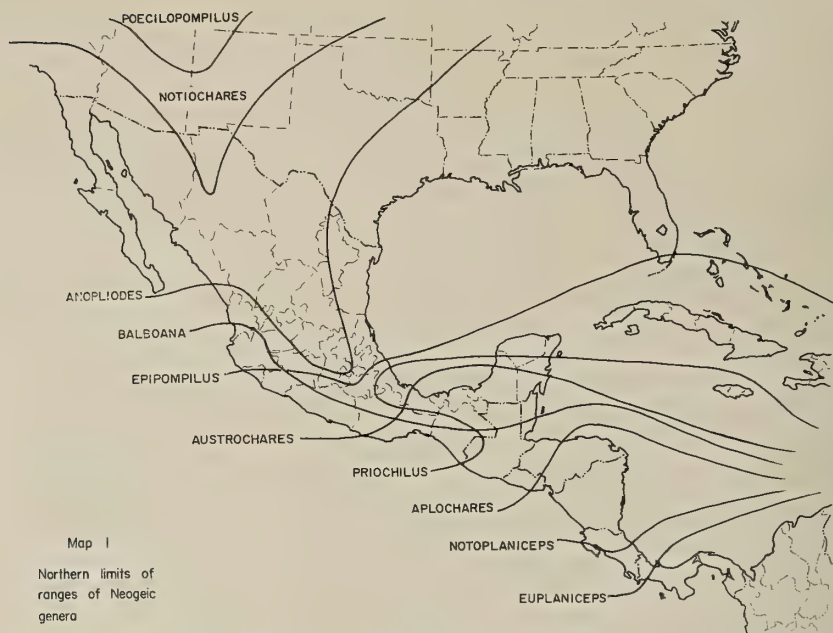
Central America is geographically part of North America, and North America is barely separated from Eurasia at the Bering Strait, which is known to have been above water much of the Tertiary. The Nearctic and Palearctic faunas have so much in common that they are often grouped together to form the Holarctic zoogeographic region. This in turn is separated from the Old World tropics principally by climate, such that the Holarctic, Oriental, and Ethiopian have had close interrelationships in the past. These three regions may collectively be referred to as the realm Megagea (Darlington, 1957, *Zoogeography*, p. 424). On the other hand, South America (also Australia) is a barrier-limited region; that is, it was separated from Megagea by a water gap for so long a period that it developed an unusually distinctive fauna. The Neotropical region is properly regarded as a separate realm, Neogea, even though there is not presently a water gap separating South and Central America. The patterns of distribution resulting from the flowing together of portions of the very different Neotropical and Nearctic faunas are complex,

and different groups of animals often present quite different pictures depending in part on their dispersal powers. Since flying insects were undoubtedly able to cross the barrier from time to time during the Tertiary, the separation of the two faunas was by no means as complete as in other groups (e.g., fresh water fishes) and the flowing together of the two faunas was by no means entirely restricted to the period following the elevation of the connection between Panama and Colombia.

Neogeic faunal elements. — Of the 39 genera or subgenera of Pompilinae occurring in Central America and Mexico, ten also occur widely in South America but are not represented in Megagea (except by those few species occurring in southern North America). These genera are presumed to have differentiated in South America and to have invaded North America relatively recently. One of these genera, *Epipompilus*, occurs also in Notogea (Australia and New Zealand), but the South American members of this genus appear to have evolved separately from the others for a considerable time. In the following list, the genera and subgenera are arranged according to the distance they have spread from South America (see also Map 1); following each generic name the number of species occurring in Central America or Mexico is indicated (all have additional species in South America).

| | |
|--------------------------|----------------------------|
| <i>Euplaniceps</i> — 1 | <i>Epipompilus</i> — 4 |
| <i>Notoplaniceps</i> — 1 | <i>Balboana</i> — 5 |
| <i>Aplochaeres</i> — 1 | <i>Anopliodes</i> — 4 |
| <i>Austrochaeres</i> — 1 | <i>Notiochaeres</i> — 2 |
| <i>Priochilus</i> — 10 | <i>Poecilopompilus</i> — 5 |

The first seven of these groups are highly distinctive genera which have not advanced beyond the more strictly tropical parts of Central America, and one supposes that these have been recent immigrants, probably after the re-establishment of the land bridge in the Pliocene. For the most part, these genera are represented in Central America by species also occurring in South America. There are, however, a few exceptions; *Epipompilus aztecus*, *Balboana nayaritana*, and *Austrochaeres mexicanus*, for example, are known only from southern Mexico, well north of their nearest relatives. These may have moved north at an earlier date, although they are not strongly differentiated from their nearest relatives.



The last three genera on this list all occur well north of the limits of the tropics, one of them even entering southern Canada. Two of these groups are subgenera of *Anoplius* (*Anopliodes* and *Notiochares*), not very strongly differentiated from the large and very widespread subgenus *Arachnophroctonus*, which is Megageic although generally warm-adapted. The third group, *Poecilopompilus*, is of generic status, but closely related to the widely distributed Old World genus *Batozonellus*. It is difficult to be sure when and where these three groups differentiated except that it was probably somewhere in tropical (probably South) America and may have involved a shorter period of isolation and earlier invasion of North America than was involved with the previous seven genera.

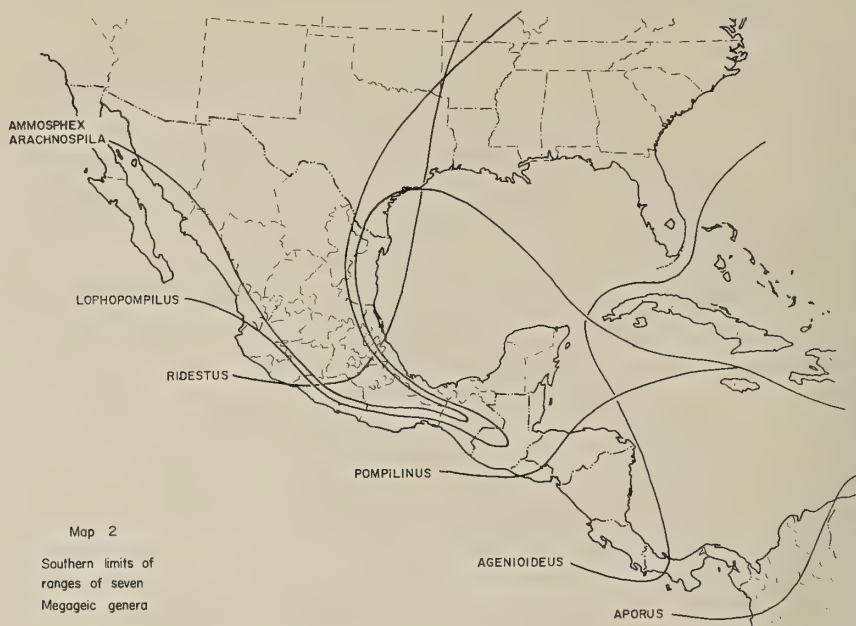
Altogether these ten genera have only 34 species in Central America and Mexico (with no additional species, but some subspecies, in the United States). Thus they make up only 24% of the total fauna. But in the more strictly tropical areas, of course, they make up a high percentage of the fauna; in fact, virtually all of the Pompilinae occurring in Central American lowland forests belong to this element.

Megageic faunal elements. — In contrast to these groups, there are 15 genera or subgenera occurring in Mexico and Central America which occur widely in the United States and also range throughout major parts of the Old World. These wasps range southward especially along the mountain ranges, and samplings taken, for example, above 8000 feet in the central volcanic belt of Mexico consist mostly or entirely of these Megageic elements. Many of the species occurring in Mexico and Central America are the same as those occurring in the United States, but there is a small amount of endemism on the specific and subspecific levels in Mexico. For example, the subgenus *Ammosphex*, well represented in Eurasia, has eleven species in America north of Mexico, five of them entering Mexico; in central Mexico there are two additional species as well as three subspecies of species occurring in the United States. Apparently populations have been isolated for varying lengths of time in the Mexican highlands because of the partial discontinuity of the mountains and increasing aridity in northern Mexico. Altogether, in the 71 species belonging to these 15 genera, there are only 13 species not occurring also in the United States. It is worth noting that one form entering the mountains of northern Mexico is only subspecifically distinct from a Eurasian species [*Pompilus (Arachnospila) fumipennis eureka* Banks].

In the following listing of genera and subgenera of Megageic affinities, arrangement is roughly according to the distance each has penetrated the neotropics (with some reservations noted below); as before, the number of species occurring in Mexico and Central America is indicated for each.

| | |
|--------------------------|-------------------------------|
| <i>Ridestus</i> — 2 | <i>Evagetes</i> — 5 |
| <i>Arachnospila</i> — 3 | <i>Episyron</i> — 4 |
| <i>Ammosphex</i> — 7 | <i>Anoplius</i> — 7 |
| <i>Lophopompilus</i> — 2 | <i>Aporinellus</i> — 6 |
| <i>Pompilinus</i> — 11 | <i>Arachnophroctonus</i> — 11 |
| <i>Agenioideus</i> — 1 | <i>Tachypompilus</i> — 3 |
| <i>Aporus</i> — 4 | <i>Paracyphononyx</i> — 3 |
| <i>Gymnochares</i> — 1 | |

The first six of these groups have moved only part of the distance to Panama, the seventh (*Aporus s. str.*) only to Colombia



(Map 2). It should be noted, however, that *Arachnospila* and *Pompilinus* are reputed to have species deep in South America (Banks, 1947) and it appears to me that certain Chilean species may be assignable to *Ammosphex*. Just how closely these forms are related to the North American species with which they are presumed to be consubgeneric remains to be determined. In any event, one can safely say in each case the South American species are rather distinctive and apparently specialized. Possibly one or two species in each of these groups "made the jump" into South America before the establishment of a land connection and underwent some evolution there.

The next five genera or subgenera on the list are each represented by one or a few species in South America, generally but not exclusively in the more temperate parts. The South American species are, for the most part, closely related to or even the same as species occurring in Central America, suggesting that the entry of these groups into South America may be fairly recent. These five genera

and the preceding seven (*Ridestus* to *Aporinellus* in the list) contain relatively few species which can be regarded as fully "tropical" in their adaptations; for example, I know of no records from the Amazon basin for any of the species.

The last three genera listed form a rather special group. All three contain quite a number of South American species, many of them decidedly adapted for hot and humid conditions. The American *Tachypompilus* all have a rather similar facies, somewhat different from that of the species of the Old World tropics. One species, *mendozae*, occurs widely in South America and barely enters Panama, while two others range into the United States chiefly at low altitudes. In the case of *Paracyphononyx* (a genus especially well represented in Africa), two of the three Central American species are of predominantly South American distribution. It appears that these two genera, along with the subgenus *Arachnophroctonus* of the genus *Anoplius*, have undergone a radiation in South America, and many if not all of the North American elements of these groups may actually have had a South American, or at least a tropical American, origin. Thus the history of these groups may not be very different from that of, for example, *Poecilopompilus* and *Notiochares*, listed earlier as Neogeic elements although actually only slightly more differentiated from their Old World relatives. All of these five genera or subgenera, and probably others, may have passed back and forth between North and South America and the islands between at various times during the Tertiary. These groups are similar to the "Pan-American" element in the bird fauna, members of which "crossed the Tertiary water gap in both directions so freely that they are difficult to assign faunally" (Mayr, 1964, Proc. Nat. Acad. Sci., 51: 286).

The Megageic elements outlined above make up 50% of the pompiline fauna of Mexico and Central America on the species level, 38% on the level of genera and subgenera. The Neogeic and Megageic elements together, which might be characterized as "widely distributed" Pompilinae with representatives in Mexico and Central America, make up 74% of the fauna on the species level, 64% on the generic and subgeneric level. It is the remaining 26% of the fauna, made up of genera of limited distribution, that is of most particular interest.

Sonoran faunal elements. — Since the majority of the genera which are endemic to southern North America seem to have their distributional centers in the arid regions of northern Mexico and extreme southwestern United States, they may be designated as “Sonoran elements” with reference to the Sonoran desert and to the Sonoran fauna as defined by Merriam. As in most other Hymenoptera and many other insects, the members of this fauna are for the most part adapted for arid, warm (but not necessarily frost-free) conditions. These wasps may represent the vestiges of stocks which inhabited North America long ago (early Tertiary) and have been able to survive competition with more successful Megageic immigrants by becoming adapted to the deserts and semideserts of southwestern North America. Not *all* representatives of this fauna are deserticolous; a few are somewhat montane (though more particularly to be found in dry canyons and mesas), and a few enter humid areas (e.g., some *Sericopompilus* and *Psorthaspis*). Presumably this fauna is pretty much the same as the “Old tropical American” fauna of some authors. Its major characteristic is the fact that none of the genera have close relatives either in the Old World or in South America. Among themselves, the genera belonging here are relatively diverse, some apparently tying in with the Megageic genus *Aporus* (*Neoplaniceps*, *Plectraporus*, *Chelaporus*, *Allaporus*), others with *Pompilus* (*Hesperopompilus*, *Xenopompilus*, *Perissopompilus*, *Xerochaes*), some of the others being very isolated (*Tastiotenia*, *Chalcochaes*, *Allochaes*).

Another unusual feature is the large number of monotypic genera or subgenera belonging to this faunal element (six out of 14, with three others having only two species). In the following listing, I have indicated the number of species in each genus known to occur in Mexico and Central America, followed by the total number of known species (in parentheses). The listing is in approximate order of size of total known range, from smallest to largest.

| | |
|------------------------------|--------------------------------|
| <i>Cameronoplius</i> — 1 (1) | <i>Neoplaniceps</i> — 1 (6) |
| <i>Tastiotenia</i> — 1 (1) | <i>Xerochaes</i> — 1 (1) |
| <i>Xenopompilus</i> — 2 (2) | <i>Chalcochaes</i> — 2 (2) |
| <i>Chelaporus</i> — 1 (1) | <i>Perissopompilus</i> — 2 (2) |
| <i>Plectraporus</i> — 1 (1) | <i>Hesperopompilus</i> — 4 (7) |

Allochaes — 1 (1)*Sericopompilus* — 2 (3)*Allaporus* — 6 (8)*Psorthaspis* — 13 (28)

Two genera, *Neoplaniceps* and *Psorthaspis*, have undergone radiation in the West Indies, the latter also in southeastern United States. *Psorthaspis colombiae* Bradley, described from mountains of Colombia, is the only species of any of these 14 genera or subgenera which enters South America. *Hesperopompilus* has undergone some radiation in western United States, but it is probable that most or all of the species of this group (also *Allaporus* and *Sericopompilus*) will be found to occur in northern Mexico, leaving *Neoplaniceps* and *Psorthaspis* as the only two genera to have undergone any important radiation outside of Mexico and adjacent parts of southwestern United States.

That most of these groups have, in fact, either evolved or been long isolated in the deserts of northern Mexico can be easily visualized when their ranges are plotted (Maps 3-6). The ranges resemble so many concentric ripples resulting from stones dropped in northwestern Mexico, the shapes of the ripples being much altered, of course, by climate and physical barriers. Two groups are exceptional in this regard, *Cameronoplus* being centered in Guerrero and Morelos, *Neoplaniceps* in Central America and the West Indies.

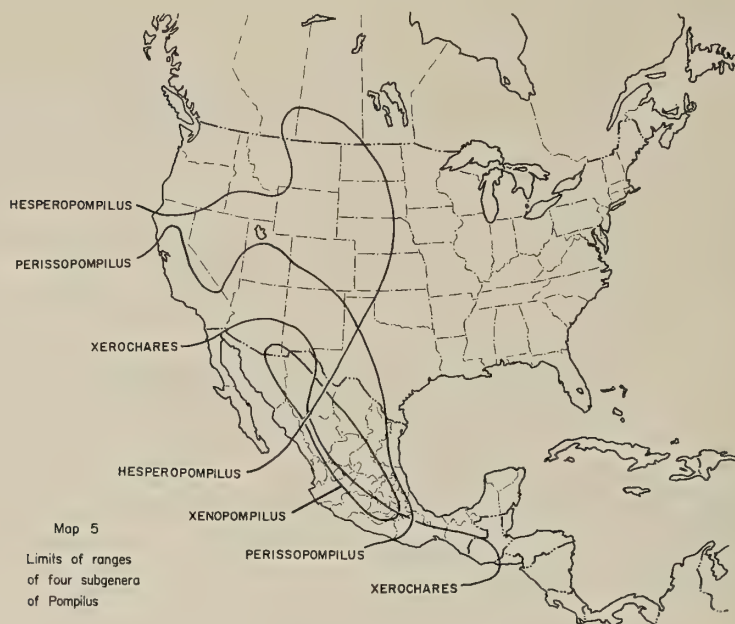
Considering the unsettled classification of the Pompilidae and the inadequate and largely unstudied fossil record, it would be mere guesswork to postulate the origin of these endemic groups. The several subgenera of *Aporus* and of *Pompilus* may represent very early invasions of their respective stocks from Eurasia, to be followed by later invasions of these same stocks. For example, I suspect that *Neoplaniceps* may present such an early stock of *Aporus* which was later largely replaced by *Aporus s. str.* *Hesperopompilus*, *Xenopompilus*, and *Perissopompilus* may represent one or more early invasions of a *Pompilus* stock, later largely replaced by the more successful and widespread subgenera *Ammosphex* and *Arachnospila* except in arid regions. Genera such as *Tastiotenia* and *Allochaes* must have been isolated for a very long time indeed to have acquired their strikingly unusual characters.

Halfpeter has recently presented an interesting review of the origins of the American insect fauna (1964, *Folia Ent. Mexicana*, no. 6, 108 pp.) in which he interprets the Sonoran element as a dry-adapted



portion of an early Tertiary fauna which invaded North America from South America. He believes that in many groups of insects (in contrast to several groups of vertebrates), the Mexican highlands provided an important center of diversification for an old South American fauna, some elements of which became adjusted to the increasing aridity of much of Mexico and the southwestern United States during the upper Tertiary. Evidence which he cites, especially from certain scarabaeid beetles, tends to support this idea. However, the pompiline wasps present a picture much more in accord with vertebrates, for the Mexican highlands are populated almost wholly by forms of clear Megageic affinities, while the Sonoran fauna, as indicated above, contains several elements which appear to represent very early intrusions from Eurasia, but none of clearly South American origin. If there is an "Old South American" or "Gondwanian" element in the Pompilinae, it is represented by such genera as *Epipompilus* and *Euplaniceps*, which are still restricted to South America and the Caribbean area.

General remarks. — One may say, then, that the pompiline fauna of Mexico and Central America is very largely (76%) North American. But the North American fauna falls readily into two elements, an "old North American" (Sonoran) fauna (26%) and a "new North American" (Megageic) fauna (50%). These percentages are, of course, relatively meaningless, since the area considered is one defined by political boundaries. As a matter of fact, the Panama-Colombia border does have biological significance, since it is close to the water barrier which once separated Central and South America. That this is true, and that the existing land bridge is quite narrow, accounts for the relatively small number of elements in the Central American fauna which have transgressed this boundary as compared to any boundaries which might be drawn farther north. Of other such boundaries, the edge of the Mexican central highlands, at about the 3000 foot contour, is most meaningful. This is generally accepted as the boundary between the Nearctic and Neotropical faunal regions, and it is true that many species of Pompilinae are limited in a rough way by this line. Perusal of Maps 1-6 shows the ranges of ten of the 39 genera and subgenera as being limited approximately by the edge of the Mexican highlands. This may not seem like a

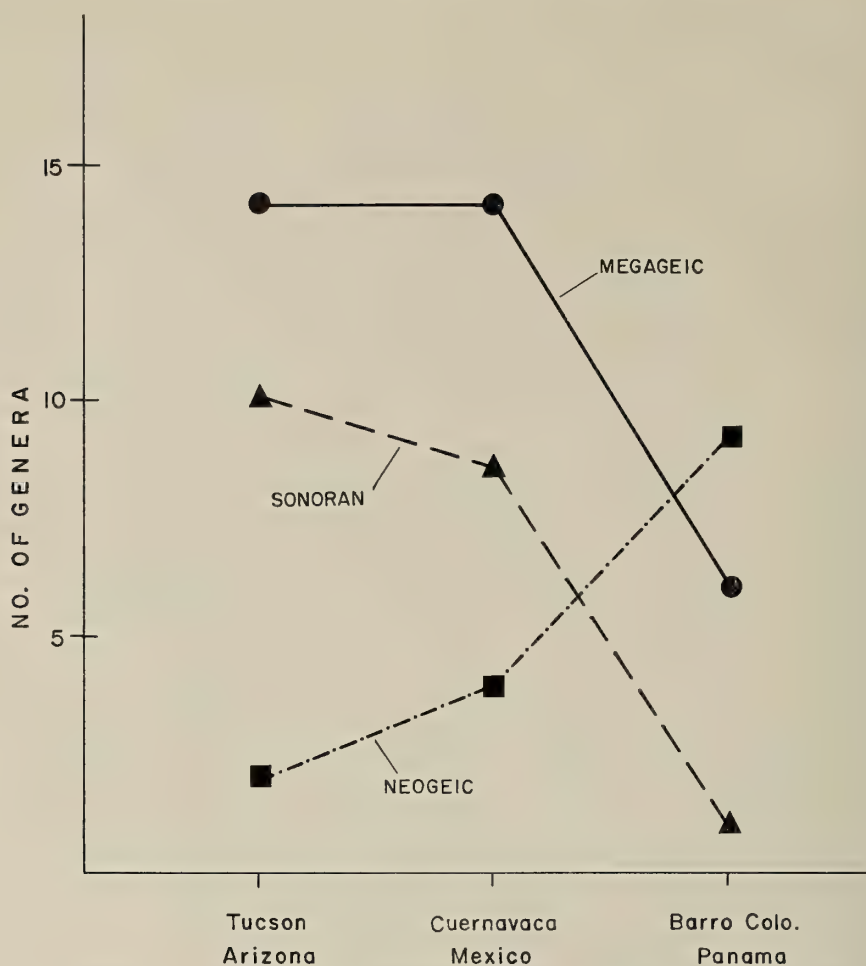


high number, but it is virtually the only reasonably consistent breaking-off point to be found. Several of the Neogeic genera have not reached this line, and one has passed it; most of the Megageic genera have pushed south well beyond it; and most of the Sonoran elements seem more particularly limited by moisture than by temperature.

It is of some interest to compare the fauna at a point in northern Mexico with that at a point in central Mexico, near the 3000 foot contour line, and with that in tropical Central America. It is necessary to select localities which have been reasonably well collected, and unfortunately only a few localities qualify. The ones selected are: (1) Tucson, Arizona, which is located in a desert basin at about 2500 feet elevation, and which has a fauna surely very similar to that of parts of the state of Sonora, which is not nearly as well collected; (2) Cuernavaca, Morelos, Mexico, which is located on the slopes of the southern part of the Mexican highlands, at about 5000 feet elevation; and (3) Barro Colorado Island and neighboring localities in the Canal Zone, not far above sea level. The distance in a straight line from the Canal Zone to Cuernavaca slightly exceeds that from Cuernavaca to Tucson.

As might be expected, the proportion of both Megageic and Sonoran elements decreases as one proceeds south, while the proportion of Neogeic elements increases (text-fig. 1). In the Canal Zone, only one Sonoran genus occurs (*Psorthaspis*), and the Megageic genera are chiefly those which have been in the neotropics a long time and have undergone a radiation there (*Tachypompilus*, *Arachnophroctonus*, *Paracyphononyx*). Cuernavaca, being at a higher elevation than Tucson, has nearly the same number of Megageic genera, but, being well south of the Sonoran deserts, has fewer Sonoran genera. When the relative number of species is plotted (text-fig. 2), much the same picture is obtained, but the fact is immediately apparent that the Megageic genera are richer in species than the Sonoran and than those portions of the Neogeic genera which have penetrated Central America.

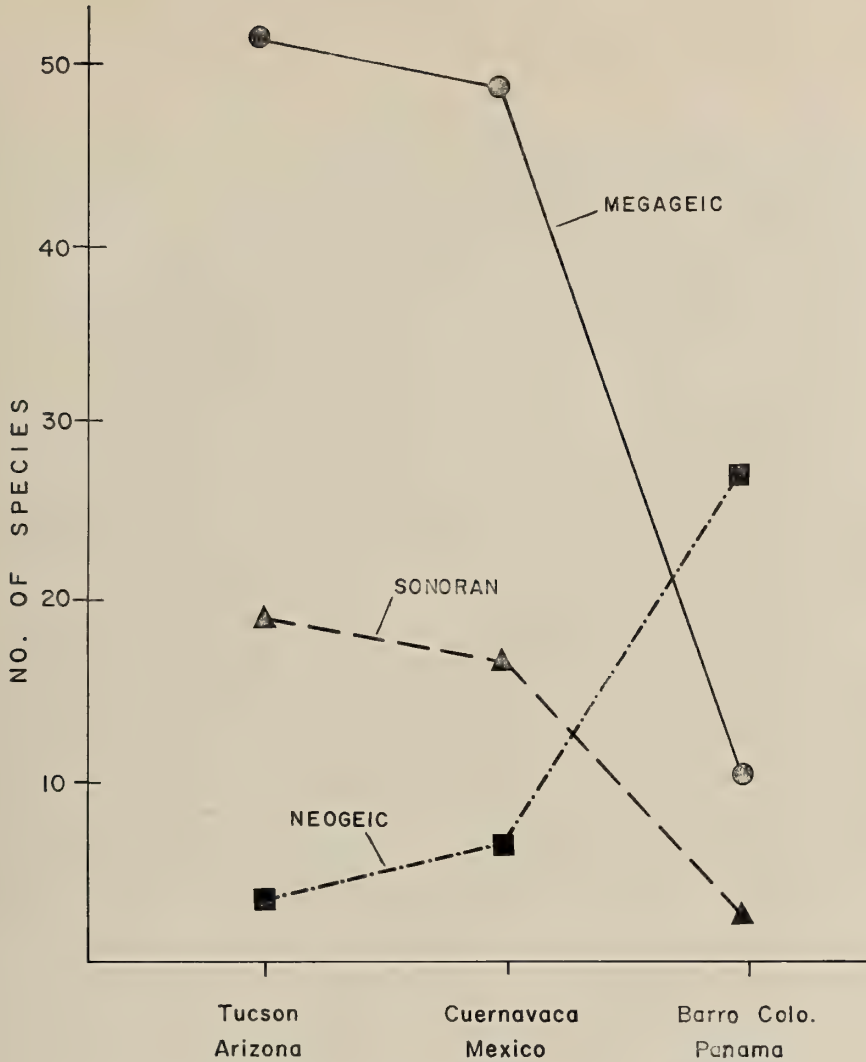
Ideally, one might obtain figures of this type for many more localities and, by plotting them on a map, and shading similar zones in similar ways, obtain a general configuration of the transition between the faunas. While this would be much more meaningful than simply drawing a line at the edge of the Mexican central plateau, it



Text-fig. 1. Proportion of Megageic, Sonoran, and Neogeic genera found at Tucson, Cuernavaca, and Barro Colorado Island.

would be quite impossible at this time because of inadequate collecting in most areas.

The origin of the West Indian pompilid fauna is a subject I hope to treat at some future date. Suffice it to say that it can only be understood in the context of the Central American fauna. Distribution patterns of some genera suggest strongly that they entered the West Indies via Central America; this includes the two West Indian "Sonoran" genera, *Psorthaspis* and *Neoplaniceps*, some of the Neogeic genera, such as *Anopliodes* and *Priochilus*, and some of the Megageic



Text-fig. 2. Proportion of Megageic, Sonoran, and Neogeic species found at Tucson, Cuernavaca, and Barro Colorado Island.

genera, such as *Aporus* and *Anoplius s. str.* In each of these cases the West Indian species are clearly closely related to, or even conspecific with, species occurring in Central America. Some West Indian elements belong to genera of such wide distribution that it is difficult to be sure at this time from which direction they arrived.

The matter must await more detailed studies of the West Indian and northern South American faunas.

SYSTEMATIC TREATMENT

The subfamily Pompilinae, as here conceived, is equivalent to the "Pompilidae trachyscelidae" of Haupt. The two most critical characters are: (1) the presence of small spines or at least spine-pits on the outer part of the hind femora, at least in the males, and (2) the presence of apical tibial spines which are of different lengths and more or less splayed out. In addition, members of this subfamily always lack a transverse groove on the second abdominal sternite and often have a small "pocket" at the inner base of the third discoidal cell.

Certain genera, particularly *Priochilus* and *Balboana*, have been treated by Banks and others as Pepsinae (or "Cryptocheilinae"), but they unquestionably belong here (although lacking the "pocket" in the outer discoidal cell, like a good many other Pompilinae).

Division of the Pompilinae into tribes is most difficult, and the efforts of Bradley, Arnold, and others in this direction have largely been failures. It is convenient to place those genera in which the females have an elongate pronotum and a somewhat flattened head together in the tribe Aporini, but I am by no means certain that this tribe is monophyletic. Arrangement of the genera in the pages which follow is a more or less conventional one. The apparently more specialized groups, the Aporini and certain of the Pompilini such as *Aporinellus* and *Allochares*, are placed first and last, the more generalized groups, such as *Agenioideus* and *Sericopompilus*, toward the middle. Perhaps *Tastiotenia*, in the Pompilini, and *Epipompilus*, in the Aporini, represent the most primitive elements in their particular tribes. However, at this stage of our knowledge of the classification of the Pompilidae, it is futile to attempt any sort of natural arrangement of the genera.

Key to Genera

Females

1. Pronotum with the collar not well differentiated from the disc, the streptaulus absent medially and the collar on nearly the same plane as the

- disc; or if on a lower plane the streptaulus is absent altogether; pronotum longer than mesoscutum in most genera; eyes sometimes wholly covered with short hairs (Aporini) 2
- Pronotum with the collar separated from the disc by a complete streptaulus, the disc sloping upward strongly from the collar; pronotum shorter than mesoscutum along the midline, or at least not notably longer; eyes never hairy (Pompilini) 8
2. Fore wing with three SMCs (figs. 1, 7, 8); front femora not incrassate, or if somewhat so the labrum is strongly exerted and the maxillary palpi very long 3
- Fore wing with two SMCs (figs. 2-6); front femora usually incrassate; labrum not strongly exerted nor the palpi unusually long 4
3. Eyes hairy; pronotum relatively short, the streptaulus absent; labrum strongly exerted; mandibles without a fimbriate groove beneath *Epipompilus* Kohl
- Eyes not hairy; pronotum elongate, the streptaulus present except medially; labrum not exerted; mandibles with a strong fimbriate groove beneath *Psorthaspis* Banks
4. SMC2 receiving only one recurrent vein, the second recurrent vein meeting cubitus beyond (or occasionally interstitial with) with second intercubital vein (figs. 2, 3) 5
- SMC2 receiving two recurrent veins (figs. 4-6) 6
5. Claws bifid; hind wing with the transverse median vein leaving the anal vein at an angle, meeting media basad of origin of cubitus by about or slightly more or less than its own length (as, e.g., in fig. 1) *Notoplaniceps* Bradley
- Claws dentate; hind wing variable, rarely as above in American species *Aporus* Spinola
6. Front tibiae with stout, decurved spines at apex; middle and hind coxae well separated, revealing the metasternum *Chelaporus* Bradley
- Front tibiae without such spines at apex; middle and hind coxae close together, the metasternum not readily visible 7
7. Transverse median vein of hind wing leaving anal vein at an angle, short and straight; SMC2 slightly if at all wider than high (fig. 5) *Allaporus* Banks
- Transverse median vein of hind wing not leaving anal vein at an angle, in fact not clearly separated from it, long and strongly arched; SMC2 nearly or quite twice as wide as high (fig. 6) *Euplaniceps* Haupt
8. Propodeum not produced postero-laterally into sharp, conical processes (such processes present on the middle of the slope in some *Tachypompilus*); legs more or less spinose; postnotum a transverse band of variable width 9
- Propodeum bearing distinct, more or less conical processes posterolaterally; either the legs smooth and almost devoid of spines or the postnotum concealed dorsally 23

9. Transverse median vein of hind wing leaving anal vein at an angle, short and straight (fig. 9); posterior rim of propodeum virtually absent *Tastiotenia* Evans
 Anal and transverse median veins of hind wing confluent and forming an arch (figs. 10-24); posterior rim of propodeum well developed 10
10. Anal lobe of hind wing very large, about three-fourths the length of the submedian cell (fig. 8); spines beneath apical tarsal segments in an irregular double row *Chalcochares* Banks
 Anal lobe of hind wing smaller, at most slightly more than half the length of the submedian cell (figs. 10-24); spines beneath the apical tarsal segments, when present, in a median row (occasionally also with one or two lateral ones) 11
11. Postnotum arcuately broadened on each side of the median line, then constricted again opposite the propodeal spiracles; anal vein of hind wing meeting media beyond the origin of cubitus (figs. 14, 15), except sometimes in *Episyron*, which possesses a scale-like pubescence on T1, and *Austrochares*, in which the fore tibiae are spined above for most of their length 12
 Postnotum a transverse band with nearly parallel margins, or broadened at the midline; hind wing variable; without scale-like pubescence; fore tibiae spined above only apically 15
12. Claws bifid; anal vein of hind wing meeting media near or slightly beyond origin of cubitus (figs. 15, 16) 13
 Claws dentate (except front claws sometimes bifid); anal vein of hind wing meeting media well beyond origin of cubitus (figs. 14, 17) 14
13. T1, and usually parts of the propodeum and thorax, bearing scale-like pubescence; clypeus transverse, its upper margin slightly irregular toward the sides *Episyron* Schiødte
 Body without scale-like pubescence; clypeus large, its upper margin strongly sinuate *Austrochares* Banks
14. Apical tarsal segments not spined beneath; spines of the front tibiae mostly on the outer side *Sericopompilus* Howard
 Apical tarsal segments spined beneath; front tibiae with a series of strong spines above *Pecilopompilus* Howard
15. Second recurrent vein of fore wing arising on the subdiscoidal vein much more than half the distance from the base of the subdiscoidal vein to the outer wing margin (figs. 10-13); apical tergite densely bristly only in a few species of *Priochilus* 16
 Second recurrent vein of fore wing arising on the subdiscoidal vein about half or somewhat less than half the distance from the base of the subdiscoidal vein to the outer wing margin (figs. 19-22), or if somewhat more than half (some *Anoplius*) the apical tergite densely bristly .. 20
16. Pulvillar pad large, the comb consisting of 18 or more short, parallel setulae; apical lateral spines on the penultimate tarsal segments more

- than half as long as the ultimate segment; clypeus with a strong, sharply defined median emargination *Aplochares* Banks
- Pulvillar pad very small, the comb consisting of a few divergent setulae; apical lateral spines of penultimate tarsal segments much shorter than above; American species with the clypeus more shallowly and broadly emarginate if at all 17
17. Claws dentate; third discoidal cell with a pocket at its lower, inner corner (fig. 10) 18
- Claws bifid, the inner ray broader than the outer ray; third discoidal cell without a pocket at its lower, inner corner (fig. 12) 19
18. Front without a tubercle as below; propodeum with the slope rather low and even, often striate or with short, pale, semi-erect pubescence *Agenioideus* Ashmead
- Front with a blunt tubercle between and slightly above the antennal sockets; propodeum strongly convex, more or less humped laterally, not striate or with semi-erect pubescence *Tachypompilus* Ashmead
19. Pronotum short, sloping evenly in front; antennae very slender throughout, the outer flagellar segments elongate; abdomen not compressed *Priochilus* Banks
- Pronotum with the disc subangularly produced anteromedially, the anterior face nearly or quite perpendicular to the disc; outer segments of flagellum rather short and thick in most species; abdomen weakly to fairly strongly compressed apically *Balboana* Banks
20. Apical tergite with numerous stiff, bristly setae, usually quite densely bristly; pulvillar comb strong, of from 12 to 26 subparallel setae *Anoplius* Dufour
- Apical tergite without bristles, often with some strong setae, but these are sparse and not bristly; pulvillar comb variable 21
21. Claws bifid; labrum fully exerted; apex of abdomen compressed *Paracyphononyx* Gribodo
- Claws dentate; labrum not usually exerted; apex of abdomen not compressed 22
22. Antennae very short, the middle flagellar segments tending to be slightly broadened and flattened on one side, third segment at most 3.5 X as long as thick, usually less than 3 X as long as thick; pulvillar comb of not more than seven weak setulae *Evagetes* Lepeletier
- Antennae long and slender, third segment generally more than 3.5 X as long as thick; pulvillar comb variable, when reduced the antennae quite long and slender *Pompilus* Fabricius
23. Front tarsus with a comb and legs otherwise rather spinose; postnotum concealed dorsally, the metanotum and propodeum in broad contact; frequently with only two SMCs (fig. 23) *Aporinellus* Banks
- Front tarsus without a comb; legs unusually smooth and devoid of spines; postnotum complete; three SMCs present; malar space fairly long *Allochares* Banks

Males

1. Fore wing with two SMCs, the second receiving only one recurrent vein, i.e., the second recurrent vein is received beyond the second intercubital vein (figs. 2, 3) 2
Fore wing with three SMCs (figs. 1, 7, 8), or if with two, both recurrent veins are received by the second SMC (figs. 4-6) (rarely the second recurrent vein is interstitial with the second intercubital vein) .. 3
2. Vertex sharply margined, the posterior surface of the head concave; parameres exceedingly slender and bearing some very strong setae (fig. 25); marginal cell slender, about 4 X as long as high *Notoplaniceps* Bradley
Vertex less sharply margined, the head not notably concave behind, or if somewhat so the parameres not as above; marginal cell less slender, not 4 X as long as high (figs. 2, 3) *Aporus* Spinola
3. Transverse median vein of hind wing leaving the anal vein at a strong angle (35 to nearly 90 degrees), short and straight, reaching media well basad of the origin of the cubitus (figs. 1, 5) 4
Transverse median and anal veins of hind wing not clearly separated, forming a continuous broad arc which curves up to meet media (figs. 8, 10) 7
4. Three SMCs present (figs. 1, 9); posterior rim of propodeum rather weakly developed 5
Only two SMCs present (figs. 4, 5); posterior rim of propodeum of normal size 6
5. Hind tarsi and tibial spurs very slender; legs clothed on their outer parts with coarse, semi-erect setulae; malar space well developed; maxillary palpi unusually long *Epipompilus* Kohl
Hind basitarsus and hind tibial spurs unusually broad and flat; legs with only fine, semiappressed pubescence; malar space absent; palpi not of unusual length *Tastiotenia* Evans
6. Second SMC not much if any wider than high; third discoidal cell higher than wide; anal lobe of hind wing about as long as submedian cell (fig. 5) *Allaporus* Banks
Second SMC about or more than twice as wide as high; third discoidal cell wider than high; anal lobe of hind wing much shorter than submedian cell (fig. 4) *Chelaporus* Bradley
7. Anal lobe of hind wing about three-fourths the length of the submedian cell (fig. 8); body densely hairy, including even the abdominal dorsum *Chalcochaes* Banks
Anal lobe smaller, at most slightly more than half the length of the submedian cell (figs. 10-16); body only occasionally as hairy as above .. 8
8. Propodeum not produced postero-laterally into sharp, conical processes, occasionally the posterior angles broadly produced 9
Propodeum bearing distinct, more or less conical processes postero-laterally 24

9. Postnotum arcuately broadened on each side of the median line, then constricted again opposite the propodeal spiracles; anal vein of hind wing meeting media beyond the origin of the cubitus (figs. 14, 15), except often in *Episyron*, which possesses a scale-like pubescence on T1, and in *Austrochares*, in which the front tibiae are spined above for most of their length 10
 Postnotum a transverse band of variable width, with nearly parallel anterior and posterior margins, or broadened at the midline, or occasionally practically absent; without scale-like pubescence; other characters variable 13
10. Claws dentate; wings showing no tendency to fold longitudinally; abdomen very slender *Sericopompilus* Howard
 Claws bifid; fore wings generally showing a tendency to fold longitudinally; abdomen in general less slender and elongate than above 11
11. Propodeum and T1 with appressed, scale-like pubescence; predominantly black, with limited whitish to yellowish maculations if any *Episyron* Schiødte
 Propodeum and T1 without scale-like pubescence; species extensively patterned with ferruginous and/or yellowish 12
12. Anal vein of hind wing meeting media near or only slightly beyond origin of cubitus (fig. 16); head only slightly wider than high (TFD roughly 1.1 X VFD) *Austrochares* Banks
 Anal vein of hind wing meeting media well beyond origin of cubitus (fig. 17); head (especially eyes) unusually wide (TFD at least 1.15 X VFD) *Poecilopompilus* Howard
13. Second recurrent vein of fore wing arising on the subdiscoidal vein much more than half the distance from the base of the subdiscoidal vein to the outer wing margin (figs. 10-13) 14
 Second recurrent vein arising on the subdiscoidal vein about or somewhat less than half the distance from the base of the subdiscoidal vein to the outer wing margin (figs. 19-22) 18
14. Claws slender and but slightly curved, with a small, erect tooth (except inner claws of front tarsi) *Agenioideus* Ashmead
 Claws stouter and more curved, with the tooth strong and sloping outward, subparallel to the outer ray (i. e., bifid), or else claws in part edentate 15
15. Propodeum strongly convex and with somewhat irregular contours, including a concave declivity; mostly ferruginous species with a blunt tubercle just above the antennal sockets *Tachypompilus* Ashmead
 Propodeal slope low and even, with no irregularities or a well defined declivity; mostly black species 16
16. A short malar space present; maxillary palpi short, the penultimate segment less than a third as long as the median length of the clypeus; wings tending to fold longitudinally *Aplochares* Banks

- Malar space absent; maxillary palpi longer, penultimate segment at least more than half as long as median length of clypeus; wings not tending to fold longitudinally 17
17. Antennae slender, filiform, sometimes very weakly crenulate in profile; pronotum short, sloping abruptly; SGP at most moderately compressed; digiti expanded and curved apically (figs. 31-36) *Priochilus* Banks
- Antennae strongly crenulate in profile, at least on the outer third; pronotum somewhat longer, in lateral view with the disc subangularly separated from the anterior face; SGP very strongly compressed; digiti rod-like (figs. 61, 62) *Balboana* Banks
18. Fore wings with only two SMCs present and with the basal vein rather strongly arched; stigma nearly as long as the length of the marginal cell along the costal margin (fig. 6); pronotum elongate *Euplaniceps* Haupt
- Fore wings with three SMCs, or if with only two the basal vein slightly if at all arched and the stigma not nearly as long as the length of the marginal cell along the costal margin 19
19. Anterior margin of clypeus convexly rounded, the clypeus not usually more than about 1.7 X as wide as high 20
- Anterior margin of clypeus truncate or slightly emarginate, the clypeus more than 1.8 X as wide as high 21
20. Propodeum with the slope rather flat in front, abruptly declivous behind, often prominent on the sides of the declivity; pronotum rather long, often nearly as long as mesoscutum, its posterior margin weakly arcuate to nearly straight *Psorthaspis* Banks
- Propodeum sloping rather evenly from front to rear, sometimes slightly steepened behind, but without a distinct declivity; pronotum rather short, angulate to subarcuate behind *Pompilus* Fabricius (subgenus *Hesperopompilus* Evans)
21. Claws bifid, i.e., the inner ray slopes outward, nearly parallel to the outer ray 22
- Claws dentate (except sometimes inner front tarsal claws), i.e., the tooth is short and erect 23
22. Labrum fully exerted, semicircular; malar space at least about as long as antennal pedicel; antennae strongly crenulate or subserrate in profile; posterior slope of propodeum with dense, erect pile *Paracyphononyx* Gribodo
- Labrum not fully exerted, sometimes partially so; malar space at most about half as long as antennal pedicel; antennae filiform, sometimes weakly crenulate in profile; propodeum not as above *Anoplius* Dufour
23. Propodeum rather convex and with quite a distinct posterior declivity; antennae short, the third segment less than twice as long as thick and distinctly shorter than fourth segment; pronotum arcuate behind (sub-

- angulate in some extralimital species); pulvillar pad and comb very weak *Evageles* Lepeletier
- Propodeum generally less convex than above, when a distinct posterior declivity is present the antennae are much longer, the third segment more than twice as long as thick; pronotum at least weakly angulate behind, often sharply so *Pompilus* Fabricius
24. Postnotum broadly concealed dorsally, the metanotum and propodeum in broad contact; legs rather spinose; often with only two SMCs (fig. 23) *Aporinellus* Banks
- Postnotum complete; legs very smooth and with reduced spines; three SMCs present; first two abdominal segments large, the remainder of abdomen tending to telescope within the basal segments *Allochaeres* Banks

Genus *EPIPOMPILUS* Kohl

- Epipompilus* Kohl, 1884, Verh. K. K. Zool.-Bot. Gesell. Wien, 34: 57 [Type species: *Epipompilus maximiliani* Kohl (= *aztecus* Cresson), designated by Ashmead, 1900]. — Haupt, 1930, Mitt. Zool. Mus. Berlin, 16: 762-763. — Bradley, 1944, Trans. Amer. Ent. Soc., 70: 146-147. — Evans, 1961, Psyche, 68: 25-37 (revision of American spp.) — Evans, 1962, Pacific Insects, 4: 773-782 (Australian spp.)
- Aulocostethus* Ashmead, 1902, Canad. Ent., 34: 132 [Type species: *Aulocostethus bifasciatus* Ashmead, monobasic]. — Haupt, 1930, Mitt. Zool. Mus. Berlin, 16: 763-765. — Bradley, 1944, Trans. Amer. Ent. Soc., 70: 140-145. Placed in synonymy by Evans, 1961.
- Epicostethus* Banks, 1947, Bull. Mus. Comp. Zool., 99: 445 [Type species: *Epicostethus williamsi* Banks, monobasic]. Placed in synonymy by Evans, 1961.

Generic characters. — Female. Length 4-14 mm. Various colored; fore wings twice-banded except wholly fuliginous in one species. Maxillary palpi (of American species) unusually elongate, antepenultimate segment the longest and exceeding the third antennal segment; labial palpi with the penultimate segment broadly ovate, the ultimate segment attached to one side of it. Mandibles stout, without a lamina or fimbriate groove on inferior margin, superior margin with a single strong tooth well back from apex. Labrum partially exerted, broad and short, apical margin of clypeus broadly truncate or arcuately concave. Malar space well developed. Head broader than high, front with distinct small punctures. Eyes (in American species) densely covered with short hairs. Flagellum with some coarse, semi-erect pubescence on inner side of basal segments. Pronotum short or moderately long; propodeum with the slope low and even, almost flat behind. Front femora slightly to moderately incrassate; legs very weakly spinose. Claws (in American species) with a strong tooth which is nearly parallel to the apical ray (ex-

cept front claws edentate in some species). Fore wing with marginal cell long, acute, removed from wing tip by much less than its own length; stigma large; three SMCs present. Hind wing with the anal lobe small, anal vein often extended slightly beyond junction of transverse median vein, the latter vein forming a strong angle with the anal vein, nearly straight, oblique, reaching the median vein much basad of origin of cubitus (fig. 1). Abdomen fusiform, conspicuously hirsute apically.

Male. Length (of known species) 4-6 mm. Known species predominantly black, with subhyaline wings. Palpi, mandibles, labrum, clypeus, and punctures of front essentially as in female. Eyes with the hairs minute and scarcely noticeable. Flagellum with coarse pubescence on its inner side, its profile weakly to strongly crenulate. Pronotum short; postnotum (in known species) at least half as long as metanotum; slope of propodeum very low. Claws with the tooth sloping outward, short and acute, so that the claws are weakly bifid, except claws of hind tarsi sometimes obscurely dentate, inner claws of front tarsi sometimes strongly curved, bifid. Venation as in female. SGP consisting of a long, slender, hairy process arising from a broad basal plate (fig. 63). Genitalia with the parameres and aedoeagus very short, shorter than the digiti and parapenial lobes; digiti simple, short-setose; basal hooklets double (fig. 60).

Distribution. — Central Mexico, southern Florida, and the Bahamas south to Peru and southern Brazil, also Australia and New Zealand.

Included species. — In my review of this genus in 1961, I recognized nine American species and stated that as far as I knew the genus was confined to the Americas. I have since discovered an additional species from the Americas (*nigribasis* Banks) and also several Australian species (reviewed in 1962). I now believe that the New Zealand species (*insularis* Kohl) is only subgenerically distinct from the American forms, and I have also described a third subgenus from Australia. All of the Neotropical species belong in *Epipompilus sensu stricto*.

Remarks. — These appear to be exceedingly rare insects, and none of the species is known from more than a few specimens. I have seen only seven Mexican and Central American specimens belonging to this genus, six of them females. The one male is here assigned somewhat tentatively to *delicatus* Turner. I described the males of two South American species in 1961.

I regard *Epipompilus* as one of the most primitive genera of Pompilidae. Of special note is the venation of the hind wing. In

most specimens the anal vein actually extends slightly beyond the junction with the transverse median vein, which leaves it at a strong angle. Among the numerous characters which appear to ally this genus with the Aporini should be mentioned the male genitalia, which are strikingly *Aporus*-like. The incrassate front femora, hairy eyes, and long pronotum (in females of several species) also suggest the Aporini.

Key to Species

Females ²

1. Abdomen black, T2 and T5 marked with whitish; hind tibia completely without spines; length 7.5-14 mm. *aztecus* (Cresson)
Abdomen in part rufous, with or without a whitish band on T2; hind tibiae with at least two minute spines above; length 4.5-7 mm. 2
2. Front angle of ocellar triangle less than a right angle, POL and OOL subequal; apex of hind femora and base of hind tibiae marked with black; second abdominal tergite yellowish-brown *insolitus* Evans
Front angle of ocellar triangle greater than a right angle, POL distinctly greater than OOL; hind legs not marked with black; base of second tergite with a whitish band 3
3. Postnotum a very narrow band, not nearly half as long as metanotum; face and clypeus testaceous, antennae wholly testaceous; hind tibiae with numerous minute spines *nigribasis* (Banks)
Postnotum medially about half as long as metanotum; face and clypeus black, antennae infuscated on apical third; hind tibiae with two minute, barely visible spines above *delicatus* Turner

Epipompilus aztecus (Cresson)

Ferreola azteca Cresson, 1869, Proc. Boston Soc. Nat. Hist., 12: 376 [Type: ♀, MEXICO: VERACRUZ: Veracruz (C. Sartorius) (ANSP, no. 437)].

Epipompilus maximiliani Kohl, 1884, Verh. K. K. Zool.-Bot. Ges. Wien, 34: 57 [Type: ♀, MEXICO: MORELOS: Cuernavaca, 1871 (Bilimek) (Vienna Mus.)].

Pompilus aztecus Cameron, 1893, Biol. Centr.-Amer., Hymen. II, p. 189.

Epipompilus azteca Ashmead, 1902, Canad. Ent., 34: 133. Synonymy of *maximiliani* first indicated.

Epipompilus aztecus Haupt, 1930, Mitt. Zool. Mus. Berlin, 16: 762. — Evans, 1961, Psyche, 68: 30-31.

Epipompilus maximilliani Bradley, 1944, Trans. Amer. Ent. Soc., 70: 146. Misspelling of *maximiliani* Kehl.

Aulocostethus aztecus Bradley, 1944, *ibid.*, p. 142.

² Only one species, *delicatus* Turner, is known from the male sex.

This is a distinctive and striking species. Bradley (1944) has redescribed the species from the type, and I have presented notes on variation and synonymy (1961).

Female. — Length 7.5-14 mm. Head black except mandibles, labrum, clypeus, and lower face rufous, lower inner eye margin with a whitish streak; thorax rufoferruginous except mesosternum black, posterior third of propodeum sometimes black, propodeal rim whitish on each side; abdomen black except T2 with a pair of large whitish spots, T5 with a basal whitish band; palpi brown; antennae with basal two segments rufous, remainder more or less infuscated; legs variable in color, partly rufous and partly black, with white maculations on the hind coxae and tibiae; middle and hind tibial spurs pale. Wings hyaline except fore wings strongly twice-banded, hind wings tipped with fuscous. Body wholly covered with pale pubescence and with short, pale erect setae which are especially dense on the front and the tip of the abdomen. Ocellar triangle very broad, POL much exceeding OOL. Pronotum of moderate length; postnotum very short, less than half as long as metanotum. Legs very smooth, hind tibiae with no spines whatever. Front femora slightly incrassate, varying from 2.6 to 2.75 X as long as wide.

Male. — Unknown.

Distribution. — Central Mexico; specifically recorded only from Morelos and Veracruz. (Map 7.)



Specimens examined. — 4 ♀ ♀. MEXICO: 1 ♀, no further data [BMNH]; VERACRUZ: 1 ♀, Veracruz (C. Sartorius) [type, ANSP]; MORELOS: 1 ♀, Cuernavaca, 1871 (Bilimek) [type of *maximiliani*, Vienna Mus.]; 1 ♀, Cuernavaca, 24 March 1959, 5500 feet (on window of house, M. A. Evans) [MCZ].

***Epipompilus insolitus* Evans**

Aulocostethus bifasciatus Haupt, 1930, Mitt. Zool. Mus. Berlin, 16: 763. — Bradley, 1944, Trans. Amer. Ent. Soc., 70: 145. Misidentification, not *bifasciatus* Ashmead 1902.

Epipompilus insolitus Evans, 1961, Psyche, 68: 35-36 [Type: ♀, COSTA RICA: Turrialba (Univ. Halle, Germany)].

This species appears closely related to the two which follow, but has little in common with Ashmead's *bifasciatus*, from Brazil, which I redescribed in 1961. Haupt has figured the head, pronotum, and fore wing of this species.

Female. — Length 7 mm. Yellowish-brown, the following black: head, apical half of antennae, first, third, and fourth tergites, apex of hind femora, and outer base of hind tibiae; coxae and hind tibiae with whitish markings. Fore wing twice-banded. Body densely covered with short whitish hairs. Ocellar triangle weakly acute in front, POL and OOL subequal. Pronotum short, hind margin obtusely angulate; postnotum half as long as metanotum. Hind tibiae with scattered short spines.

Male. — Unknown.

Distribution. — Costa Rica; known only from the type. (Map 7.)

***Epipompilus nigribasis* (Banks) new combination**

Ageniella nigribasis Banks, 1925, Bull. Mus. Comp. Zool., 67: 331 [Type: ♀, PANAMA: Barro Colorado Island, Canal Zone, 13 July 1924 (NB) (MCZ, no. 15, 341)].

I overlooked this species in my recent treatment of *Epipompilus*, since Banks had described it in another subfamily and made no mention of the hairy eyes or other salient features of this genus.

Description of type female. — Length about 5 mm.; fore wing 3.8 mm. Body entirely pale ferruginous except as follows: occiput and vertex fuscous, front moderately infuscated except on the sides and below, where it is pale ferruginous like the clypeus; T1 blackish except with a sub-basal ring and an apical band of pale ferruginous; T2 with a broad whitish basal band followed

by a narrow band of pale ferruginous and a black apical band; T3 wholly blackish and the sternite somewhat so; eyes greenish; antennae straw-colored basally, darkening to pale ferruginous apically; legs pale ferruginous except hind tibiae with a basal whitish annulus, all coxae with a fuscous basal spot but otherwise mostly straw-colored. Fore wings with setulae coarse, especially along anterior margin; wing membrane with a broad transverse brown band across the basal and transverse median veins, covering a considerable part of the first two discoidal cells, and with a second broad brown band filling the marginal cell and extending to the posterior wing margin; hind wings subhyaline, and with a weak subapical dark band. Head and thoracic dorsum with abundant short, silvery, suberect setae; pleura, propodeum, and abdomen with short silvery pubescence. Head wider than high, width 1.16 X height. Clypeus 2.5 X as wide as its median height, apical margin arcuately emarginate, revealing the small, semicircular labrum. Front narrow, MID .51 X TFD, 1.2 X LID, .77 X HE; UID 1.25 X LID. POL: OOL=5:3; ocellar triangle broad, front angle greater than a right angle. First four antennal segments in a ratio of about 12:5:8:12, segment three 2.5 X as long as thick, .35 X UID. Eyes wholly covered with short hairs. Pronotum short, disc along midline about .6 as long as mesoscutum, posterior margin subangulate. Postnotum a very narrow strip, along the midline measuring less than a third the length of the metanotum. Propodeum with the slope low and even, the median line not impressed. Legs moderately spinose for the genus; middle and hind tibiae both with numerous short spines; hind tibia with eight spines in two rows on upper side, and with a delicate carina on its inner side for its entire length. Fore wing with marginal cell removed from wing tip by .8 its own length; SMC3 1.6 X as long as second; basal vein arising far beyond junction of transverse median vein. Hind wing with transverse median vein forming almost a right angle with anal vein; cubitus obsolete beyond junction with intercubital vein.

Male. — Unknown.

Distribution. — Panama; known only from the type. (Map 7.)

Epipompilus delicatus Turner

Epipompilus delicatus Turner, 1917, Ann. Mag. Nat. Hist., (8) 20: 359 [Type: ♀, PANAMA: Bugaba (GCC) (BMNH, no. 19, 316)]. — Bradley, 1944, Trans. Amer. Ent. Soc., 70: 146. — Evans, 1961, Psyche, 68: 35.

Both Bradley and I published on this species without having seen the type. More recently I have had an opportunity to study the type, and a full description is provided below. The species keys well in the key I presented in 1961, except that the tibiae have two minute, barely noticeable spines. It seems conceivable, though I think

not probable, that *nigribasis* Banks and/or *insolitus* Evans may fall within the range of variation of this species. The probable male is described here for the first time.

Description of type female. — Length 6 mm.; fore wing 5 mm. Head black; thorax rufo-ferruginous except lower posterior sides of pronotum pale and sides of propodeal rim whitish; abdomen blackish, basal half of T2 with a whitish band, base of T1, apex of T4, and all of T5 and T6 rufous, basal and apical sternites also rufous; antennae rufous except scape with a whitish apical spot, flagellum infuscated on apical third; legs rufous except coxae pale apically and hind tibia with a basal whitish annulus. Fore wings with coarse setulae which form a brownish area at base, a brown band across basal and transverse median veins, and another brown band from marginal cell to lower outer wing margin; wing tips hyaline; area between bands somewhat luteous. Pubescence of front and thoracic dorsum coarse, somewhat golden, that of rest of body silvery, that on sides of propodeal slope very coarse. Head much wider than high, width 1.2 X height. Clypeus much broader than high. Front narrow, MID .51 X TFD, 1.28 X LID, .75 X height of eye; UID 1.15 X LID. POL:OOL=16:13; ocellar triangle broad, front angle greater than a right angle. First four antennal segments in a ratio of about 8:3:6:8, segment three 2.5 X as long as thick, .45 X UID. Eyes wholly covered with short hairs. Pronotum short, its posterior margin arcuate, disc sloping evenly to much lower plane of collar. Postnotum medially about half as long as metanotum. Propodeum with its slope low and even. Legs smooth and with only a few minute spines; hind tibiae with only two weak spines above, with a delicate raised line on its inner side for its entire length. Fore wing with marginal cell removed from wing tip by .75 X its own length; SMC3 1.5 X as long as second; basal vein arising well beyond junction of transverse median vein.

Male (assigned here tentatively). — Length 4 mm.; fore wing 3.3 mm. Head and thorax black except the clypeus and mouthparts wholly straw-colored, the following ivory-white: sides of lower face (the two streaks connected by a narrow band passing close above the antennal insertions), posterior margin of pronotum, and paired spots on the extreme posterior margin of propodeum; antennae dark brown except scape lighter brown beneath; legs brownish-fuscous except as follows: much of front coxae and ventral and apical parts of middle and hind coxae ivory-white, a basal ring on hind tibia ivory-white, front legs beyond coxae testaceous, middle femora and parts of tibiae and coxae testaceous; abdomen dark brownish-fuscous; fore wing very lightly infuscated on apical third. Clypeus 1.7 X as wide as high, its apical margin concave. Head 1.16 X as wide as high; front narrow, MID .56 X TFD; inner orbits strongly diverging above, UID 1.35 X LID; ocelli in a broad triangle, POL:OOL=6:5. Antennae very short, flagellum weakly crenulate in profile; segments three and four about 1.4 X as long as wide, segments 5-12

only about 1.1 X as long as wide. Pronotum broadly subangulate behind; postnotum on the midline nearly as long as metanotum; slope of propodeum very low and even. Hind femora with several spines extending above the coarse pubescence; both claws of front tarsus strongly curved, bifid, the outer claws more conspicuously so than the inner claws; claws of hind tarsus very weakly dentate; longer spur of hind tibia as long as basitarsus. Wings as in female except SMC3 barely longer than SMC2. SGP and genitalia as shown in Figs. 60 and 63.

Distribution. — Costa Rica and western Panama. (Map 7.)

Specimens examined. — 1 ♀, 1 ♂. PANAMA: 1 ♀, Bugaba [type, BMNH]. COSTA RICA: 1 ♂, Tilaran, Guanacaste Prov., about 1000 feet, 25 Feb. 1964 (HEE) [MCZ].

Remarks. — The male is strikingly like that of *excelsus* Bradley, from Brazil, the terminalia differing only in minor details; however, it is smaller and differently colored. As mentioned earlier, I cannot be sure that this is the male of *delicatus* and not that of *insolitus*, *nigribasis*, or an unknown female. The POL:OOL ratio suggests that it may not go with *insolitus*, while the long postnotum suggests that it is probably not the male of *nigribasis*. The characters are approximately what I would predict for the male of *delicatus*, and this assignment may as well stand until enough material is available to review the genus in a more thorough manner.

Genus NOTOPLANICEPS Bradley

Aporus (*Notoplaniceps*) Bradley, 1944, Trans. Amer. Ent. Soc., 70: 100 [Type species: *A. (N.) fenestralis* Bradley, original designation].

Notoplaniceps Banks, 1947, Bull. Mus. Comp. Zool., 99: 447 (elevated to generic status).

Generic characters. — Female. Maxillary palpi short; labial palpi short, simple. Mandibles with the inferior margin not dentate, with a fimbriate groove. Clypeus very short, arcuate; labrum broad, barely exerted. Antennal orbits on a line with bottoms of eyes. Eyes wholly covered with short hairs. Crest of vertex relatively sharp; vertex straight in anterior view, strongly concave as seen from above. Pronotum of moderate length; propodeum with an abrupt declivity behind. Legs moderately spinose, front femora moderately incrassate. Claws bifid, inner ray subparallel to outer ray, truncate, subtruncate, or acute. Fore wing with stigma and marginal cell both rather slender, acute apically; only two SMCs present, the second receiving only the first recurrent vein. Hind wing with transverse median vein leaving anal vein at an angle, slightly arcuate, reaching median vein basad of origin of cubitus by about or slightly more or less than its own length.

Male. Vertex very sharp, temples virtually absent, the posterior surface of head concave. Antennae unusually short, flagellar segments (except the last) no longer than wide. Eyes not hairy. Claws bifid, inner ray truncate; inner claw of front tarsus strongly curved, the rays well separated. SGP elongate, apex narrowly rounded; parameres of genitalia very long, bearing strong setae; aedoeagus small, flanked by strong, compressed parapenial lobes (fig. 25). Wings as in female.

Distribution. — Costa Rica to Colombia, east to Brazil.

Included species. — Four names can be assigned to this genus: *canescens* Smith, *minutus* Smith, *innotatus* Banks, and *fenestralis* Bradley. The first two were described from the same locality (Pará, Brazil) and probably represent opposite sexes of one species, while the other two species appear distinct from *canescens* and from each other. However, it is possible that some of the male paratypes of Bradley's *fenestralis* go with *canescens* rather than with *fenestralis*. Only one species, *innotatus*, occurs in Central America.

Remarks. — Bradley was incorrect in stating that the inner ray of the claws is acute in females of this genus. In *canescens* the inner ray is abruptly truncate, while in the other two species it varies from subtruncate to subacute.

This genus is separated from *Epipompilus* by a considerable morphological gap and is the first of a series of genera having only two submarginal cells in the fore wing and centering around the large genus *Aporus*. Perhaps *Notoplaniceps* stands somewhat closer to *Epipompilus* than other genera of this complex; at least the claws and the venation of the hind wing are somewhat similar, and the eyes of the female are densely hairy. The nature of the pile on the apical part of the abdomen of the female is also similar to that of *Epipompilus*.

Notoplaniceps innotatus (Banks)

Planiceps innotatus Banks, 1925, Bull. Mus. Comp. Zool., 67: 337 [Type: ♀, PANAMA: Barro Colorado Island, Canal Zone, 19 July 1924 (N. Banks) (MCZ, no. 15, 351)].

Aporus (*Notoplaniceps*) *innotatus* Bradley, 1944, Trans. Amer. Ent. Soc., 70: 103.

Description of type female. — Length 4.5 mm.; fore wing 4 mm. Entirely black; pubescence conspicuously silvery on lower front, sides of thorax, legs, propodeum, and base of abdomen, elsewhere brownish. Fore wing mod-

erately infuscated except subhyaline on basal third and with a subhyaline streak crossing the wing at the stigma; hind wing subhyaline. Front, thoracic dorsum, and apical abdominal tergites with dark, short, backward-directed bristles above which stand a few longer, erect setae; legs without setae, pubescence on outer side of front femora coarse and suberect. Head 1.12 X as wide as high; MID .65 X TFD, 1.3 X LID; UID and LID subequal. Front angle of ocellar triangle very slightly less than a right angle; POL:OOL=5:7. First four antennal segments in a ratio of about 15:5:10:11, segment three 2.5 X as long as thick, .44 X UID. Vertex moderately acute. Pronotal disc .6 X as long as wide, very slightly longer than mesoscutum. Propodeum without a median impression, sloping weakly in front, much more abruptly behind. Front femora 2.5 X as long as their maximum width. Claws bifid, inner ray close to outer ray and subparallel to it, subtruncate at tip. Fore wing with basal vein arising well basad of transverse median vein; marginal cell removed from wing tip by slightly more than its own length; SMC2 1.7 X as wide as high; second recurrent vein reaching cubital vein beyond second intercubital vein by about five times its own width.

Plesiallotype. — ♂, PANAMA: Barro Colorado Island, Canal Zone, 14 June 1956 (C. W. & M. E. Rettenmeyer) [KU].

Description of plesiallotype male. — Length 4.3 mm; fore wing 3.8 mm. Entirely black; pubescence coarse, extensively silvery, brownish on vertex, thoracic dorsum, and apical half of abdomen. Fore wing lightly infuscated except basal .4 hyaline and with an irregular hyaline streak below the stigma; hind wings hyaline. Body without erect setae except for a few weak ones on the front and vertex. Clypeus 2.3 X as wide as high, its apical margin evenly convex. Head subcircular in anterior view, measuring 1.04 X as wide as high, vertex forming a high, even arc above eye tops. MID .68 X TFD, 1.5 X LID; UID 1.44 X LID; POL:OOL=15:16; front angle of ocellar triangle slightly exceeding a right angle, posterior ocelli separated from vertex crest by less than their own diameters. Antennae very short, their total length only 1.6 X TFD; first four segments in a ratio of about 22:8:8:9, segments 3-12 each slightly wider than long. Pronotal disc gently arched in profile, its length along midline subequal to that of mesoscutum. Propodeum nearly flat in front, abruptly declivous behind. Legs strongly spinose; claws bifid, inner ray truncate, closely parallel to outer ray and of about the same length. Wing venation as in female. Abdomen slender, compressed apically. SGP elongate, narrowly rounded apically, keeled along the midline. Genitalia with the parameres exceedingly slender, bearing some very large setae for their entire length; volsellar digitus small, bearing five large setae and one weak one (fig. 25).

Distribution. — Panama and Costa Rica. (Map 8.)

Specimens examined. — 6 ♀ ♀, 8 ♂ ♂. PANAMA: 5 ♀ ♀, 6 ♂ ♂,

Barro Colorado Island, Febr., Mch., June-Aug. (KWC, NB, CWR, C. H. Curran) [MCZ, USNM, AMNH, KU], 1 ♂, Pacora, 14 May 1952 (F. S. Blanton) [USNM]; 1 ♀, Summit, Canal Zone, Nov. 1946 (N. L. H. Krauss) [USNM]. COSTA RICA: 1 ♂, Los Diamantes, 28 May 1949 (KWC) [USNM].

Variation. — The Summit female is slightly larger (fore wing 4.3 mm.); the front femora measure 2.3 X as long as wide, the second submarginal cell 1.5 X as wide as high. In other respects, including head measurements, the resemblance to the type is very close. The males show considerable size variation (fore wing 3.8-5.7 mm.), and the larger specimens have the wings more heavily infuscated, more as in the female. The claws show considerable variation, some specimens having the inner ray shorter than the outer ray and almost acute apically.

Genus *APORUS* Spinola³

Aporus Spinola, 1808 Insect. Ligur., 2: 5 [Type species: *Aporus bicolor* Spinola, designated by Latreille, 1810]. — Haupt, 1927, Deutsch. Ent. Zeitschr., Beiheft, pp. 264-269. — Haupt, 1930, Mitt. Zool. Mus. Berlin, 16: 730-751 (review of Palaearctic spp.). — Bradley, 1944, Trans. Amer. Ent. Soc., 70: 86-108 (review of New World spp.).

Planiceps Latreille, 1825, Fam. Regne Animal, p. 467 [Type species: *Pompilus planiceps* Latreille, monobasic]. — Haupt, 1930, Mitt. Zool. Mus. Berlin, 16: 734-735 (subgenus of *Aporus*).

Actenopoda Ashmead, 1902, Canad. Ent., 34: 88 [Type species: *Actenopoda rileyi* Ashmead (= *niger* Cresson), monobasic].

Generic characters. — Female. Length 5-18 mm. Wholly black or various patterned with whitish, yellow, or rufous. Mandibles with one or two small teeth on superior margin, inferior margin paralleled by a fimbriate groove, sometimes dentate. Clypeus short, nearly as wide as LID. Antennal sockets at or near level of bottoms of eyes. Eyes relatively narrow, with or without dense short hairs. Pronotum relatively long, much longer than mesoscutum. Propodeum with an oblique, nearly flat declivity. Front femora incrassate. Claws dentate. Fore wing with two SMCs, the second receiving only the first recurrent vein. Hind wing with the transverse median vein often differentiated from the anal vein and leaving it at a slight angle, but in some American species more or less arched into the median vein, which it reaches slightly to considerably before the origin of the cubitus (figs. 2, 3).

Male. Antennae short or moderately long. Eyes not hairy. Claws den-

³ For complete synonymy, see also the various subgenera. For discussion of generic synonymy, see under "remarks" below.

tate or bifid, inner ray always acute. Venation as in female. SGP compressed, narrow or fairly broad. Genitalia with the parameres either long and attenuate or short and more or less truncate; digiti of simple structure, bearing short or long setae; basal hooklets of volsellae single, occasionally reduced and not hook-like; parapenial lobes stout, compressed; aedoeagus simple, slender (figs. 26, 27).

Distribution. — Palaearctic, Nearctic, and Neotropical regions.

Included species. — Haupt (1930) recognized eight Palaearctic species. In the New World the genus is represented by a larger number of species which show much more diversity in color and structure. Eight species inhabit continental North and Central America, and a ninth species occurs in the mountains of Columbia (described below). Seven additional species occur in the West Indies. Three subgenera are recognized for these 16 species.

Remarks. — The generic name *Aporus* is here used in its conventional sense, even though Pate (1946, Trans. Amer. Ent. Soc., 72: 112-115) has argued that the name *Aporus* should be transferred to the group otherwise called *Tachyagetes* Haupt, with Ashmead's name *Actenopoda* being resurrected for *Aporus* in the usual sense. I cannot agree to the adoption of a generic name such as *Actenopoda*, which has never been used since its proposal in 1902, so long as there remains a possibility that Pate was wrong, for neither Pate nor Haupt (whom he follows regarding the identity of *bicolor* Spinola) had actually seen the type of Spinola's species. If Spinola's type is still in existence and turns out to be a *Tachyagetes* and not an *Aporus*, then application should be made to the International Commission of Zoological Nomenclature for the preservation of *Aporus* in the sense that it has always been used. In any case, *Actenopoda* cannot be used as the generic name, as the name *Planiceps* is available. Haupt considered *Planiceps* a subgenus of *Aporus*, and it is surely no more than that.

It seems to me probable that *Aporus* (*sensu stricto*) underwent most of its evolution in the Old World, since the Old World species retain a primitive venation of the hind wing, the transverse median vein leaving the anal vein at an angle and often being straight. Of the New World *Aporus* (*sensu stricto*), only *umbratilis*, from Columbia, retains this condition of the hind wing (except for the otherwise apparently specialized *hirsutus*, sole member of the subgenus

Plectraporus). *Neoplaniceps* is in several respects close to *Noto-planiceps* and presumably represents a more ancient stock of the genus. The subgenera *Neoplaniceps* and *Aporus* have both evolved several brightly colored species in the Antilles. In Central America, *Neoplaniceps* is represented by a single all-black species, but two species of *Aporus sensu stricto* have developed color patterns.

Key to Subgenera of *Aporus*

Females

1. Eyes densely covered with short hairs; apical abdominal tergites with an abundance of short, semierect setae *Neoplaniceps* Bradley
Eyes glabrous or virtually so; apical abdominal tergites pubescent and setose, sometimes with some inconspicuous semierect pile 2
2. Front tarsus with a comb formed of short, thick spines; malar space distinct; antennal orbits situated mostly below level of bottoms of eyes; body and legs very hairy *Plectraporus* Bradley
Front tarsus without such a comb; malar space very short; antennal orbits situated mostly or wholly above level of bottoms of eyes
..... *Aporus* Spinola

Males ⁴

1. Anal and transverse median veins of hind wing confluent, forming a smooth, broad arc and meeting median vein not far basal of origin of cubitus (fig. 3) *Aporus* Spinola
Transverse median vein of hind wing more or less differentiated from the anal vein, leaving the anal vein at a slight angle and arching up to join median vein well basal of origin of cubitus (as in fig. 2, although sometimes more arcuate than figured) 2
2. Claws bifid, the tooth strong and sloping outward, parallel to the outer ray; parameres not as below, in the one known Central American species as shown in Fig. 59 *Neoplaniceps* Bradley
Claws of middle and hind tarsi dentate, the tooth short and nearly erect; parameres relatively large, sublanceolate, with a series of setae extending longitudinally-obliquely along the ventral surface *Plectraporus* Bradley

Subgenus **NEOPLANICEPS** Bradley

Aporus (*Neoplaniceps*) Bradley, 1944, Trans. Amer. Ent. Soc., 70: 104 [Type species: *Planiceps tarsalis* Ashmead, original designation].

⁴ The subgenera are difficult to separate in the male sex. This key is not entirely satisfactory, and major reliance must be placed upon the male genitalia. Any males which are not entirely black will fall in *Aporus s. str.*

Planiceps Bradley, 1944, *ibid.*, pp. 107-108 (*nec* Latreille; misidentification).

Subgeneric characters. — Female. Clypeus a very short arcuate band. Antennal sockets at or slightly below level of bottoms of eyes. Eyes densely covered with short hairs. Malar space absent. Front tarsus without a comb of stout spines. Hind wing with transverse median vein leaving anal vein at an angle, usually somewhat curved before joining median vein a short distance or rather far basad of origin of cubitus (fig. 2).

Male. Front claws bifid, strongly curved, inner claws of each pair more so than outer ones; middle and hind tarsal claws bifid, the tooth sloping outward, fairly close to the outer ray. Venation as in female. Genitalia with the parameres slender, short or fairly long; digiti simple, bearing some strong setae; basal hooklets absent (fig. 59; also Bradley, 1944, pl. IV, fig. 18).

Distribution. — Known only from the West Indies and from Central America between the Isthmuses of Panama and Tehuantepec.

Included species. — The known West Indian species are *tarsalis* (Ashmead) (♀, ♂, St. Vincent), *cariborum* Bradley (♂, St. Vincent), *funestus* n. sp. (♀, Martinique), *prolixus* Bradley (♀, St. Croix), and *antillarum* Bradley (♀, Haiti and Cuba). This subgenus was not recorded from the continent by Bradley, but one species, described below, inhabits Central America. The West Indian species are variously marked with red, except *funestus*, which is all black like the Central American species.

Remarks. — Bradley placed *antillarum* in *Planiceps* largely on the basis of the tooth on the inferior margin of the mandibles, but I do not consider this a character of generic importance. Like Bradley, I have not seen specimens of the type species of *Planiceps*, but I assume it does not have hairy eyes, as no one has described them. If the eyes do prove to be hairy, the synonymy of *Neoplaniceps* with *Planiceps* should be considered.

Aporus (*Neoplaniceps*) *chiapanus* new species

Holotype. — ♀, MEXICO: CHIAPAS: 17 mi. W. of Tuxla Gutierrez, about 3000 feet elev., 24 April 1959 (HEE) [MCZ, no. 30, 957].

Description of type female. — Length 8.5 mm.; fore wing 7 mm. Entirely black; pubescence silvery laterad of each antennal socket, elsewhere dark, reflecting bluish in certain lights; fore wings fuscous, violaceous, hind wings subhyaline, somewhat infuscated apically. Front and thoracic dorsum with dense, short, backward-directed setae above which rise a few longer, fully erect setae; coxae weakly setose, but femora and propodeum without con-

spicuous setae; apical abdominal tergites with short, backward-directed setae above which rise some much longer setae. Clypeus a very short, arcuate band, nearly five times as wide as its median length. Mandibles with a small tooth on the inner margin, outer margin somewhat angulate but not actually dentate. Head 1.07 X as wide as high; MID .65 X TFD, 1.25 X LID, .83 X HE; UID .95 X LID. Ocelli forming a right triangle, the posterior ocelli about their own diameters from vertex crest, which is moderately sharp; POL:OOL = 22:21. First four antennal segments in a ratio of about 27:7:18:19, segment three 2.6 X as long as wide, .45 X UID. Pronotum moderately long, disc measuring .9 as long as its maximum width, 1.25 X as long as mesoscutum; disc in profile quite flat, descending in front to the slightly lower plane of the collar. Propodeum without a median impression and without transverse striae; in profile the propodeum slopes very weakly on the anterior three-fourths, abruptly thereafter. Front femora strongly swollen, 2.0 X as long as their maximum width; longer spur of hind tibia .54 X as long as basitarsus; claws strongly dentate, the tooth sloping outward slightly. Fore wing with basal vein arising slightly basad of transverse median vein; marginal cell removed from wing tip by 1.3 X its own length; SMC2 2.1 X as wide as high, narrowed by .4 above; second recurrent vein reaching cubital vein a very short distance beyond second intercubital vein (by about twice its own width) (fig. 2). Hind wing with transverse median vein leaving anal vein at an angle, oblique and slightly arcuate, reaching median vein basad of origin of cubitus by about half its own length. Abdomen short, fusiform, apex only rather weakly compressed.

Allotype. — ♂, BRITISH HONDURAS: Augustine Mt. Pine Ridge, 3-7 July 1963 (CCP) [MCZ].

Description of allotype male. — Length 5 mm.; fore wing 4.4 mm. Black; wings hyaline, fore wing weakly infuscated on the apical third. Pubescence extensively silvery, conspicuously so on the pleura, coxae, and propodeum; body without erect hairs. Head only 1.02 X as wide as high, the clypeus rounded below and the vertex forming an even arc above the eye tops; vertex sharp; posterior surface of head slightly concave. Clypeus 1.8 X as wide as high. MID .68 X TFD; eyes strongly divergent above, UID 1.5 X LID. Ocelli in a broad, flat triangle, POL:OOL = 8:7; posterior ocelli removed from vertex crest by approximately their own diameters. Antennae very short, their total length considerably less than twice TFD; first four segments in a ratio of about 25:8:10:11, flagellar segments (except the last) barely longer than thick. Pronotal disc nearly as long as mesoscutum; center of metanotum prominent, almost pointed; postnotum very narrow, slightly wider medially than laterally; propodeum with a rounded declivity on the posterior fourth. Claws bifid; legs strongly spinose. Fore wing essentially as described and figured for female, except marginal cell removed from wing tip by only 1.1

X its own length, SMC2 only 1.8 X as wide as high. SGP narrow, subacute, compressed and tectiform. Genitalia as shown in fig. 59.

Paratype. — ♀, COSTA RICA: Pacuare, 1949 (KWC) [USNM].

Variation. — The paratype resembles the type closely, but is slightly larger (fore wing 8 mm.). Erect setae are similarly distributed, and the pubescence is similar except that the coxae, the posterior slope of the propodeum, and the basal parts of the first three abdominal tergites have the pubescence somewhat silvery like the face. Head measurements agree closely with the type, but POL and OOL are equal. The front femora measure 2.2 X as long as wide; the pronotum is shorter, the disc measuring only .7 as long as wide. In the fore wing the second recurrent vein is received beyond the second intercubital vein by four times its own width.



Distribution. — Southern Mexico, British Honduras, and Costa Rica; known only from the type, allotype, and paratype. (Map 8.)

Aporus (*Neoplaniceps*) *funestus* new species

Holotype. — ♀, MARTINIQUE: Fort de France, 31 May 1944 (H. Stehle) [USNM, no. 67, 140].

Description of type female.—Length 10 mm.; fore wing 6.5 mm. Entirely black; pubescence rather coarse and silvery to cinereous on the lower front, clypeus, temples, pleura, and basal parts of legs, elsewhere brownish; fore wings moderately infuscated, hind wings subhyaline, darker apically. Pilosity as described for *chiapanus*, but the abdomen has most of the setae rubbed off. Clypeus a very short, arcuate band as in *chiapanus*; mandibles not dentate below; antennae arising well below bottoms of eyes from the lower side of a strong, V-shaped frontal prominence. Head 1.05 X as wide as high; MID .69 X TFD, 1.20 X LID, .84 X HE; UID .92 X LID; POL: OOL = 10:9. First four antennal segments in a ratio of about 23:6:13:14, segment three 2.1 X as long as wide, .40 X UID. Pronotum very long, the disc measuring approximately as long as wide, about twice as long as the mesoscutum; sides of disc very abrupt, almost ridged; disc with a weak median impression on the anterior third. Propodeum smooth, with a strong declivity on the posterior fourth. Front femora strongly swollen, about twice as long as their maximum width; longer spur of hind tibia .53 X as long as basitarsus; claws with the tooth strong, nearly parallel to outer ray, which is rather strongly curved. Wing venation similar to that of *chiapanus*; SMC2 shorter than in that species, only 1.6 X as wide as high, narrowed by more than half above; second recurrent vein received well beyond second intercubital vein; hind wing with the transverse median vein longer and more arched than in *chiapanus*, reaching the median vein basad of the origin of the cubitus by about half its own length.

Remarks.—This is the only all-black species of *Neoplaniceps* known from the West Indies. It differs from *chiapanus* in having a much longer pronotum and a shorter second SMC, as well as in other details of venation and body proportions.

Subgenus APORUS Spinola

Aporus Spinola, 1808, Insect. Ligur., 2: 5 [Type species: *Aporus bicolor* Spinola, designated by Latreille, 1810].

Actenopoda Ashmead, 1902, Canad. Ent., 34: 88 [Type species: *Actenopoda rileyi* Ashmead (= *niger* Cresson), monobasic].

Melanaporus Ashmead, 1902, *ibid.*, p. 132 [Type species: *Planiceps euferalis* Fox, monobasic]. — Bradley, 1944, Trans. Amer. Ent. Soc., 70: 86, 110. Synonym by Evans, 1958, Ent. News, 69: 152.

Odontaporus Bradley, 1944, *op. cit.*, pp. 110-116 [Type species: *Planiceps notabilis* Smith, original designation]. Synonym by Evans, 1958, *op. cit.*, p. 152.

Subgeneric characters.—Female. Clypeus relatively longer and less arcuate than in the other subgenera, generally about 3 X as wide as long. Antennal sockets slightly above level of bottoms of eyes. Eyes glabrous, actually

with extremely minute, barely visible setae. Malar space absent or very short. Front tarsus without a comb of stout spines. Venation of hind wing variable; most species with the transverse median vein smoothly continuous with anal vein, arching up to join median vein not far basad of origin of cubitus (fig. 3).

Male. Claws dentate or bifid, front claws modified as in *Neoplaniceps*. Venation as in female. SGP of moderate breadth, tectiform, in lateral view rather deep. Genitalia with the parameres either long and slender or short and subtruncate.

Distribution. — Palaearctic, Nearctic, and Neotropical regions, in the Neotropics not known to occur south of Colombia.

Included species. — The numerous species described from Mexico and Central America can, in my opinion, be reduced to three, two of them polytypic; two of these species also occur in southwestern United States. One other species (*luxus*) occurs widely in the United States and barely enters northwestern Mexico. A second U. S. species (*niger*) may enter northeastern Mexico, although there are presently no Mexican records; this species is included in the key, but not treated further. Also included in the key and described in the text is a single species occurring in Colombia. The known West Indian species are: *euferalis* (Fox) (♂, Jamaica), *cupripennis* (Banks) (♀, Jamaica, probably a synonym of *euferalis*), and *simulatrix* Bradley (♀, Cuba, Puerto Rico). *A. calcaratus* (Fox), known only from the type male from Southern Florida, may possibly be the male of *simulatrix*.

Remarks. — The weakness of Bradley's genus *Odontaporus* is demonstrated by the fact that he included the male of *idris* in *Aporus* (under the name *zapotecus*), the female in *Odontaporus* (under the name *aureolus*). Furthermore, two of his species of *Aporus* (*yavapai* and *bequaerti*) have a tooth on the inferior margin of the mandibles and will therefore run to *Odontaporus* in his key (except on color); actually both of these names belong in the synonymy of *notabilis* and its subspecies, the type species of *Odontaporus*.

Key to Species Occurring in Continental America

Females

1. Transverse median vein of hind wing forming an angle with the anal vein, reaching the median vein basad of the origin of the cubitus by about its own length; inferior margin of mandibles not dentate; abdominal

- tergites 1-5 each with a basal band of silvery pubescence and an apical band of dark pubescence (Colombia) *umbratilis* n. sp.
- Transverse median and anal veins of hind wing smoothly continuous with one another, arching up to join the median vein a short distance basad of the origin of cubitus (fig. 3) 2
2. Inferior margin of mandibles not dentate, merely slightly arcuately expanded (all-black species occurring chiefly in the United States) 3
- Inferior margin of mandibles with a distinct tooth (all-black or variously colored species chiefly inhabiting Mexico and Central America) 4
3. Front femora weakly incrassate (2.5-3.1 X as long as wide); front rather smooth, with a covering of very short backward-directed setulae above which rise a few large setae; second intercubital vein somewhat oblique *niger* (Cresson)⁵
- Front femora moderately incrassate (2.3-2.7 X as long as wide); front covered with somewhat stronger backward-directed setae and a somewhat larger number of erect setae; second intercubital vein usually nearly erect; pubescence in general more intensely bluish than above *luxus* (Banks)
4. Fore wings fuscous; head and thoracic dorsum without dense orange pubescence; T4 black 5
- Fore wings subhyaline, with two strong fuscous bands; front of head covered with dense orange tomentum, posterior half of pronotum and all of mesoscutum also with tomentum of this color; T4 orange-brown 8
5. Vertex crest rounded (about as in *luxus*); front very broad, MID at least .67 X TFD, at least .9 X HE; black, the pubescence reflecting bluish *concolor* (Smith)
- Vertex crest rather sharp; front relatively more narrow, MID less than .67 X TFD, about .80-.85 X HE; black, abdomen with or without white spots (*notabilis*) 6
6. Pronotum unusually long and parallel-sided, length of the disc subequal to its width; eyes diverging strongly above, UID 1.23-1.26 X LID; body wholly black *notabilis prolongatus* n. subsp.
- Pronotum shorter, generally somewhat wider behind than in front, length of disc measuring .75-.90 X its maximum width; eyes less divergent above, UID not more than 1.20 X LID 7
7. Wholly black or T2 with two small whitish spots; front femora strongly incrassate (in most specimens from 1.9 to 2.15 X as long as wide); UID from 1.10 to 1.20 X LID *notabilis pulchritarsis* (Cameron)
- Abdomen with five whitish spots, two each on T2 and T3, one on the apical tergite; front femora less strongly incrassate (measuring 2.2-2.55 X as long as wide); UID subequal to LID *notabilis notabilis* (Smith)

⁵ Not known to occur in Mexico, but common in Texas so doubtless it enters the northeastern part. For a recent redescription, see Bradley, 1944, pp. 92-94. To the synonymy given by Bradley may be added *hermes* Bradley (see Evans, 1956, Ent. News, 67: 6).

8. T4 and 5 largely light orange-brown; posterior ocelli removed from vertex crest by slightly more than their own diameters *idris idris* (Cameron)
 T5 black, at least apically; posterior ocelli removed from vertex crest by slightly less than their own diameters *idris comptus* (Bradley)

Males

1. Body entirely black, including the tibial spurs; parameres elongate, much exceeding the digiti (fig. 26) 2
 Body with white markings at least on the spurs or pronotum; parameres short, obliquely truncate, shorter than the digiti (fig. 27) 4
2. Antennae relatively elongate for the genus (segments 4-12 in most specimens more than 1.5 X as long as thick); second intercubital vein nearly erect in most specimens; parameres somewhat elbowed and with a few setae set on the inner margin near the apex *luxus* (Banks)
 Antennae more compact (segments 4-12 in most specimens less than 1.5 X as long as thick); second intercubital vein somewhat oblique; parameres elbowed or not, setae on ventral surface sometimes close to inner margin, but not actually set in the margin 3
3. Body pubescence rarely reflecting bluish except in a very small part; parameres somewhat elbowed about midway; basal hooklets of volsellae normal, hook-like *niger* (Cresson)
 Body pubescence extensively bluish, greenish, or violaceous; parameres evenly curved (fig. 26); basal hooklets reduced to small, rounded flaps, not hook-like *concolor* (Smith)
4. Tibial spurs black, pronotum with a whitish band along posterior margin; antennae very compact (segments 4-12 each about 1.05-1.2 X as long as thick); parameres and volsellae with many clubbed setae (fig. 27); Central Mexico *idris idris* (Cameron)
 Panama *idris comptus* (Bradley)
 Tibial spurs whitish, pronotum with or without a white band; antennae less compact, segments 4-12 varying from 1.25-1.8 X as long as thick; parameres and volsellae with the setae not clubbed (*notabilis*) 5
5. Pronotum without a white band; abdomen not spotted; eyes but slightly convergent above, UID .90-.97 X MID *notabilis prolongatus* n. subsp.
 Pronotum margined with a whitish band behind; abdomen usually with four white spots and the tip with a white spot; eyes more convergent above, UID .80-.90 X MID 6
6. Upper front with punctures small and close together, not much impressed at ocelli; propodeum rather flat in front, then more abruptly declivous behind *notabilis pulchritarsis* (Cameron)
 Upper front with punctures somewhat larger and more widely spaced than above, also distinctly impressed in front of front ocellus and laterad of posterior ocelli; propodeum sloping more evenly from front to rear
 *notabilis notabilis* (Smith)

Aporus (*Aporus*) *umbratilis* new species

Aporus canescens Banks, 1947, Bull. Mus. Comp. Zool., 99: 447 (*nec* Smith 1873; misidentification).

Holotype. — ♀, COLOMBIA: Vista Nieve, San Lorenzo Mts., 16 Dec. 1922 (JB) [MCZ, no. 30, 958].

So far as known, this is the only species of *Aporus* to enter South America. The species is of unusual interest because the venation of the hind wing is more as in *Neoplaniceps*, *Plectraporus*, and Old World *Aporus* than in the North and Central American *Aporus*. The eyes are very slightly more hairy than in most true *Aporus*, but much less so than in *Neoplaniceps*, and the antennae are not inserted as low as in *Neoplaniceps* and *Plectraporus*. Possibly this is a relict of an early, ancestral stock of *Aporus*.

Description of type female. — Length 10.5 mm.; fore wing 8 mm. Entirely black; fore wings moderately infuscated, non-violaceous but with weak coppery reflections; hind wings lightly infuscated. Pubescence silvery on sides of face, sides and venter of thorax, posterior slope of propodeum, basal parts of legs, basal half of T 1-5 and most of abdominal venter; elsewhere dark, obscurely violaceous. Front, thoracic dorsum, posterior slope of propodeum, coxae, outer side of front femora, abdominal venter and apical tergite with short erect setae, not very dense or conspicuous. Inferior margin of mandibles rounded, not dentate. Clypeus about 3 X as wide as high. Antennal sockets slightly above a line drawn between bottoms of eyes. Eyes with short, inconspicuous setae, most noticeable near bottoms. Head 1.11 X as wide as high; MID .63 X TFD, 1.25 X LID, .87 X HE; UID and LID subequal. Ocelli in about a right triangle, the posterior ocelli slightly less than their own diameters from the vertex crest, which is moderately sharp; POL:OOL = 3:4. First four antennal segments in a ratio of about 23:7:14:15, segment three 2.4 X as long as wide, .34 X UID. Pronotum relatively short for the genus, disc measuring .65 X as long as wide, 1.33 X as long as mesoscutum. Propodeum nearly flat in front, with an oblique posterior declivity. Front femora 2.3 X as wide as long. Claws with the tooth strong, erect, outer ray curved so that it is nearly parallel to the tooth. Fore wing with basal vein arising considerably basad of transverse median vein; marginal cell removed from wing tip by 1.15 X its own length; SMC2 2.1 X as wide as high, narrowed by half above; second intercubital vein strongly oblique; second recurrent vein reaching cubital vein beyond second intercubital by only about its own width. Hind wing with transverse median vein leaving anal vein at a slight angle, somewhat curved, reaching median vein basad of origin of cubitus by about its own length. Abdomen slightly compressed apically.

Male. — Unknown.

Distribution. — Known only from the type.

Aporus (Aporus) luxus (Banks)

Planiceps luxus Banks, 1914, Jour. N. Y. Ent. Soc., 22: 304 [Type: ♀, CALIFORNIA: National City, 15 May (VanDuzee) (MCZ, no. 13, 704)].

— Banks, 1919, Bull. Mus. Comp. Zool., 63: 242.

Planiceps assimilis Banks, 1917, Bull. Mus. Comp. Zool., 61: 100 [Type: ♀, BRITISH COLOMBIA: Penticton, 11 Aug. 1909 (J. B. Wallis) (MCZ, no. 10, 009)]. — Banks, 1919, op. cit., p. 242. New synonym.

Aporus (Aporus) luxus luxus Bradley, 1944, Trans. Amer. Ent. Soc., 70: 90-91. — Wasbauer, 1960, Pan-Pac. Ent., 36: 175-176.

Aporus (Aporus) luxus assimilis Bradley, 1944, op. cit., p. 91. — Wasbauer, 1960, op. cit., pp. 175-177.

Wasbauer (1960) has argued for subspecific status for *assimilis*, but I cannot agree that 75% separation on one character in one sex is sufficient to justify a trinomen. This species has been recorded only once from Mexico, but it is doubtless not uncommon in northern Baja California and Sonora.

Female. — Length 8-14 mm. Black, the pubescence rather strongly bluish or violaceous, often silvery on sides of the lower front; fore wings fuscous, violaceous; hind wings lightly infuscated, darker apically. Erect setae and body pile essentially as described for the following species, *concolor*; erect setae on front femora absent or inconspicuous in specimens from southern parts of the range. Mandibles without a tooth on the lower margin. Clypeus about 3 X as wide as high. Front rather broad, MID .66-.72 X TFD; UID and LID subequal; ocelli in a broad triangle, POL considerably exceeding OOL. Vertex crest not very sharp, about as in *concolor*. Front femora moderately incrassate, measuring 2.3-2.7 X as long as wide. Fore wing with the second intercubital vein curved slightly on upper part, otherwise more or less straight and erect; SMC2 varying from 1.5 to 1.8 X as wide as high.

Male. — Length 5-9 mm. Black; pubescence strongly reflecting bluish, in small to large part silvery, the posterior slope of the propodeum with coarse, semi-erect silvery pile; wings lightly to moderately infuscated, darker apically. Inner orbits divergent above; POL subequal to or slightly exceeding OOL. Antennae more elongate than in related species, segment three 1.1-1.3 X as long as thick, segments 4-12 generally at least 1.5 X as long as thick. Wings as in female, but SMC2 often smaller, 1.3-1.6 X as wide as high. SGP relatively broad and truncate, with a high median ridge (Bradley, 1944, pl. IV, fig. 1). Genitalia with the parameres slender, much like those of *concolor* but somewhat elbowed (pl. IV, fig. 20 in Bradley, 1944).

Distribution. — British Columbia south to Baja California, east to Arizona and Utah. Wasbauer (1960) presented detailed distribu-

tion records, although some of them from the southern parts of the range probably apply to *concolor*. (Map 11.)

Mexican specimens examined. — 1 ♀. BAJA CALIFORNIA: 1 ♀, San Vicente, 8 July 1963 (JP) [CIS].

Aporus (Aporus) concolor (Smith)

Planiceps concolor Smith, 1860, Jour. Ent., 1: 80 [Type: ♀, MEXICO: OAXACA: Oaxaca (BMNH, no. 19, 765)]. — Cresson, 1867, Trans. Amer. Ent. Soc., 1: 137. — Fox, 1893, Proc. Calif. Acad. Sci., (2) 4: 9 (Baja California).

Pompilus (Planiceps) concolor Cameron, 1893, Biol. Centr.-Amer., Hymen. II, p. 186.

Pompilus monticola Cameron, 1893, *ibid.*, p. 190-191 [Type: ♂, MEXICO: GUERRERO: Xucumanatlán, 7000 feet, July (HHS) (BMNH, no. 19, 745)]. *New synonym.*

Aporus (Aporus) concolor Bradley, 1944, Trans. Amer. Ent. Soc., 70: 97.

This species was listed as unrecognizable by Bradley, and its synonym *monticola* omitted from consideration altogether. Actually the species is widely distributed in Mexico and also enters southwestern United States, where it has usually been misidentified as *luxus* Banks. The resemblance to *luxus* is, in fact, great, but SMC2 is generally longer and the second intercubital vein more sloping, and there are other differences as indicated in the key.

Description of type female. — Length 15 mm.; fore wing 9.5 mm. Color black, entire body and legs covered with brilliant bluish pubescence; wings fuscous, violaceous. Front and thoracic dorsum with three types of pile: the very short pubescence, some slightly longer setae which are curved backward, and some sparse, longer, fully erect setae. Erect setae also present on temples, propleura, and front coxae; scape with a few setae; thoracic dorsum with sparse setae, propodeum bare; front femora with a few setae below and on the sides; apex of abdomen setose. Lower margin of mandible with a sharp tooth. Clypeus 3 X as broad as high, its upper and lower margins both arcuate. Head 1.08 X as broad as high; front broad, MID .72 X TFD, 1.4 X LID, .95 X HE; UID 1.04 X LID. POL:OOL = 18:15; ocellar triangle broad, front angle more than a right angle; posterior ocelli about their own diameters from vertex crest. First four antennal segments in a ratio of about 33:7:20:20, segment three 2.2 X as long as thick, .36 X UID. Vertex passing straight across between eye tops, crest rounded as seen in side view. Pronotal disc .8 X as long as wide, 1.3 X as long as mesoscutum, anteriorly descending gradually to somewhat lower plane of collar. Propodeum with a weak median

impression and an abrupt, oblique declivity. Front femora 2.4 X as long as wide; longer spur of hind tibia .45 X length of basitarsus. Fore wing with basal vein arising slightly basad of transverse median vein, lower section straight, then strongly arcuate above; marginal cell removed from wing tip by 1.25 X its own length; SMC2 1.7 X as broad as high, narrowed by slightly more than half (.55) above; second intercubital vein sloping slightly. Hind wing with anal vein not closely paralleling preaxillary furrow, curving up to meet the median vein slightly basad of origin of cubitus (fig. 3). Abdomen weakly compressed apically.

Plesiallotype (homotype of *monticola* Cameron). — ♂, MEXICO: MORELOS: 3 mi. N. Alpuyecá, 3400 feet, 3 April 1959 (HEE) [MCZ].

Description of plesiallotype male. — Length 8 mm.; fore wing 7 mm. Color black, pubescence reflecting bluish over much of thoracic dorsum and pleura, extreme sides of propodeum, and sides and apices of basal abdominal terga, elsewhere silvery and rather coarse, especially on the propodeal declivity. Wings hyaline, fore wing with a lightly infuscated apical band. Moderately dense, short erect hairs are present on the scape, front, vertex, temples, and propleura; much sparser and generally paler hairs are present on the thoracic dorsum, coxae, and abdomen. Clypeus twice as broad as high, its margin weakly convex. Head 1.1 X as broad as high; front broad, MID .70 X TFD, 1.5 X LID, subequal to HE; UID 1.4 X LID. POL and OOL subequal; ocelli in a broad, flat triangle, posterior ocelli separated from vertex crest by about their own diameters. First four antennal segments in a ratio of about 14:5:6:7, segment three very slightly longer than thick, segments 4-12 each about 1.15 X as long as thick. Posterior margin of pronotum arcuate, with a weak median notch. Claws bifid; longer spur of hind tibia .7 X the basitarsus. SGP moderately broad, broadly rounded apically, with a high median ridge. Genitalia with the parameres evenly curved, not elbowed, bearing strong setae laterally and ventrally, but not on the inner margin; digiti with strong, knobbed setae, most of them strongly bent midway, the volsellae also with some knobbed setae at the base of the digitus; basal hooklets reduced to simple flaps, not hook-like; parapenial lobes slightly shorter than aedoeagus, much expanded apically (fig. 26).

Distribution. — Texas and California to Costa Rica. (Map 9.)

Specimens examined. — 27 ♀♀, 18 ♂♂. TEXAS: 1 ♀, Austin, Nov. 1900 (C. T. Brues) [MCZ]; 2 ♀♀, Alvin, 13 June 1956 (HEE) [MCZ]; 1 ♀, McDade, 27 June 1934 (J. E. Gillaspay) [MCZ]. NEW MEXICO: 1 ♀, White Sands Nat. Mon., Otero Co., 9 Sept. 1962 (HAS) [OSU]. ARIZONA: 1 ♀, Southwestern Res. Sta., Chiricahua Mts., 6 Sept. 1958 (PDH) [CIS]; 1 ♂, Portal, Co-

chise Co., 29 June 1963 (A. Raske) [CIS]. CALIFORNIA: 1 ♀, 1 ♂, San Diego, Aug. (H. A. Hill) [MCZ]; 2 ♂♂, Los Angeles Co. (Coquillett) [USNM]. BAJA CALIFORNIA: 1 ♀, Colonia Guerrero, 10 Aug. 1959 [CAS]; 1 ♀, San Quintin, 9 April 1938 (W. E. Simonds) [CAS]; 1 ♀, Cabo San Lucas, 16 Mch. 1953 (P. H. Arnaud) [CAS]; 1 ♀, 10 mi. E. San Ignacio, 39 Sept. 1941 [CAS]; 1 ♀, 7 mi. N. Santa Anita, Hwy. 19, 1 July 1959 (HBL) [CAS]; 1 ♀, 19 mi. W. La Paz, 31 Dec. 1958 (HBL) [CAS]; 3 ♀♀, Sierra San Pedro Martir, La Grulla, 6500', 30 May 1958 (JP) [CIS]. DURANGO: 2 ♀♀, Durango, 6000 feet, 22-23 Oct. 1957 [OSU]; 1 ♂, 5 mi. W Durango, 14 May 1962 (FDP) [UCD]. ZACATECAS: 1 ♀, 3 ♂♂, 15 km. E Sombrerete, 28-31 July 1951 (HEE) [MCZ, CU]; 1 ♂, Fresnillo, 7000 feet, 15 Aug. 1947 (CDM) [AMNH]. NAYARIT: 1 ♂, 21 July 1954 (EIS) [CAS]. JALISCO: 1 ♀, 8 mi. S Guadalajara, Sept. 1954 (FXW) [CAS]. GUANAJUATO: 1 ♂, 25 mi. NW Salvatierra, 28 July 1954 (EIS) [CIS]. DISTRITO FEDERAL: 1 ♀, San Jeronimo, 11 June 1946 (J. & D. Pallister) [AMNH]. MORELOS: 2 ♀♀, 3 mi. NW Cuernavaca, 20-26 May 1959, 6500 feet (HEE) [MCZ]; 2 ♂♂, 3 mi. N. Alpuyeca, 3400 feet, 3 April 1959 (HEE) [MCZ]; 1 ♀, Yautepec, 13 July 1963 (FDP) [UCD]. GUERRERO: 1 ♂, Xucumanatlán, 7000 feet, July (HHS) [BMNH]. OAXACA: 1 ♀, Oaxaca [type, BMNH]; 1 ♀, Nochixtlan, 23 Aug. 1963 (HAS) [OSU]. CHIAPAS: 1 ♂, Ixtapa, 11 Apr. 1962 (FDP) [UCD]; 1 ♂, 20 mi. S Tuxtla Gutierrez, 12 Aug. 1963 (FDP) [UCD]. BRITISH HONDURAS: 1 ♂, Augustine Mt. Pine Ridge, 3 July 1963 (CCP) [MCZ]. COSTA RICA: 1 ♀, 6 mi. W Turrialba, 3800 feet, 23 July 1963 (HAS) [OSU].

Variation.—In the available females, the front femora vary from 2.10 to 2.45 X as long as wide; the second submarginal cell varies from 1.7 to 2.0 X as wide as high, and is narrowed above by from .45 to .65. Females from Baja California are consistently more hairy and have the pubescence somewhat duller and more greenish than is usual in the species. The females from Costa Rica and from Nochixtlan, Oaxaca, have the front somewhat narrower than usual (MID .67 X TFD, .90 X HE in both); both are smaller than average, the fore wing measuring 8.5 mm. in the Costa Rica specimen, only 7.0 mm. in the Nochixtlan specimen. In several females POL and OOL are subequal.

In the males studied, the fore wing varies in length from 4.5 to 7.5 mm. There is little variation in color of the pubescence of the males except in specimens from southern California, which have the pubescence almost entirely dark, including the coarse, semierect pubescence on the propodeal slope. Two of four specimens from Zacatecas have the wings unusually pale, the apical band entirely absent, while the British Honduras male (the smallest seen) has the wings wholly lightly infuscated. The terminalia of eight males from diverse localities were extracted and found to exhibit little variation except that the SGP varies somewhat in width and may be subtruncate apically.



Aporus (Aporus) notabilis notabilis (Smith) new combination.

Planiceps notabilis Smith, 1960, Jour. Ent., 1: 80 [Type: ♀, MEXICO (no further data) (? location of type)]. — Cresson, 1867, Trans. Amer. Ent. Soc., 1: 137.

Pompilus (Planiceps) notabilis Cameron, 1893, Biol. Centr.-Amer., Hymen. II, p. 186 (recorded from Veracruz, Mexico).

Pompilus flavomarginatus Cameron, 1893, *ibid.*, p. 191 [Type: ♂, MEXICO: YUCATAN: Temax (Gaumer) (BMNH, no. 19, 703)]. New synonym.

Odontaporus notabilis Bradley, 1944, *Trans. Amer. Ent. Soc.*, 70: 114-115 (both sexes redescribed; recorded from Guatemala and Costa Rica).

Although this striking form has been recognized for more than a century, its close relationship to other *Aporus* having the vertex sharply margined has not been appreciated. Males closely resembling *notabilis* and identified as such by myself (1951, *Synoptic Catalog of Hymenoptera*, p. 922) range north to Arizona, while females have not been taken north of Veracruz. There can be little question that the males from western and northern Mexico and southern Arizona actually belong with *yavapai* Banks, a two-spotted form which is otherwise indistinguishable from the immaculate *pulchritarsis* Cameron. To add to the confusion, Banks described *bequaerti* from Yucatan, well within the range of the five-spotted *notabilis* and agreeing closely with it structurally; yet *bequaerti* is completely without maculations.

This situation can be resolved if we consider *pulchritarsis* a subspecies of *notabilis* which is usually wholly black in the female sex, but which may have a pair of small white spots on the second tergite (*yavapai*) (these spots are barely perceptible in some specimens). The type of *bequaerti* is best interpreted as an intermediate, having the color of *pulchritarsis* and most structural features of typical *notabilis*. A male taken at the same time and place as the type of *bequaerti* is a typical male *notabilis*. I have here placed *bequaerti* in the synonymy of *notabilis pulchritarsis* with the notation that it is properly considered an intergrade with *n. notabilis*. The specimens from Texas and northeastern Mexico formerly assigned to *bequaerti* in reality belong to a third subspecies, which is described below. The males of *n. notabilis* and *notabilis pulchritarsis* are separable only with difficulty, and specimens from Hidalgo and San Luis Potosi appear to be intergrades. The male terminalia of all three subspecies appear identical.

Female. — Length 12-16 mm. Black, T2 and T3 each with a pair of large yellowish-white spots, apical tergite with a single spot of the same color; wings moderately infuscated. Pubescence cinereous to light brownish, somewhat metallic on parts of the dorsum; front rather smooth, with short, fine

backward-directed setulae and few erect setae. Inferior margin of mandibles dentate. Clypeus a narrow band nearly 3.5 X as broad as long. Head about 1.07 X as wide as high; MID .62 X TFD; UID subequal to LID; POL: OOL = 5:4. Margin of vertex relatively abrupt; posterior ocelli less than their own diameters from vertex crest. Pronotal disc .73-.82 X as long as its greatest width, about 1.4 X as long as mesoscutum. Propodeum with a rather abrupt, nearly flat declivity. Front femora 2.2-2.55 X as long as wide. Fore wing with SMC2 nearly twice as wide as high, the second intercubital vein straight, sloping slightly. Hind wing with the anal vein arching up to meet the median vein slightly basal of the origin of the cubitus.

Male. — Length 6-8 mm. Black, except as follows: posterior margin of pronotum with a narrow to broad yellowish-white band; T2 and T3 each with a pair of large whitish spots (sometimes also T4), apical tergite with a whitish spot; tibiae with a whitish streak on the outer side toward the base (streaks on front and middle tibiae sometimes reduced, even absent); tibial spurs whitish. Wings hyaline or lightly infuscated, usually with a darker band on outer margin of fore wing. Pubescence silvery over much of head and thorax; posterior slope of propodeum with coarse, semi-erect silvery pubescence. Clypeus 1.75 X as broad as high, its apical margin rounded. MID .62 X TFD; eyes convergent at the top, UID .80-.90 X MID; front with the punctures quite distinct and well separated, front slightly depressed along the upper eye margins, in front of the anterior ocellus, and laterad of the posterior ocelli, the ocellar triangle itself slightly elevated. POL slightly exceeding OOL. Antennae of moderate length, segments 4-12 each 1.3-1.5 X as long as thick. Propodeum with the slope rather low, almost even or somewhat steepened behind. Terminalia as figured by Bradley (1944, pl. IV, figs. 5, 17) and as described further below, under *notabilis prolongatus*.

Distribution. — Veracruz and Yucatan to Costa Rica. (Map 10.)

Specimens examined. — 4 ♀♀, 3 ♂♂. MEXICO: 1 ♀, without further data [BMNH]. VERACRUZ: 1 ♀, Veracruz, June 1888 (HHS) [BMNH]. YUCATAN: 1 ♀, No. part (Gaumer) [BMNH]; 1 ♂, Temax (Gaumer) [BMNH]; 1 ♂, Chichen Itza, June 1929 (JB) [MCZ]. GUATEMALA: 1 ♀, Pt. Barrios, 3-14 March 1905 (J. S. Hine) [MCZ]. COSTA RICA: 1 ♂, Santa Ana, July 1923 (F. Tristan) [ANSP].

Variation. — The single male from Costa Rica is notably darker than those from Mexico; the white line on the pronotum is very thin, the spots on the second tergite unusually small, the streaks on the front and middle tibiae absent, and the spurs decidedly dusky. No females are known from south of Guatemala, and it will be interesting to learn if the maculations are reduced in this sex. The intergrades mentioned above are discussed under *notabilis pulchritarsis*.

Aporus (Aporus) notabilis pulchritarsis (Cameron) new status

Pompilus (Planiceps) pulchritarsis Cameron, 1893, Biol. Centr.-Amer., Hymen. II, p. 185 [Type: ♀, MEXICO: GUERRERO: Chilpancingo, June, 4000 feet (HHS) (BMNH, no. 19, 764)].

Planiceps bequaerti Banks, 1931, Bull. Brooklyn Ent. Soc., 26: 131 [Type: ♀, MEXICO: YUCATAN: Chichen Itza, June 1929 (JB) (MCZ, no. 16, 536)]. New synonym, as an intergrade with *n. notabilis* (Smith).

Planiceps yavapai Banks, 1933, Psyche, 40: 1 [Type: ♀, ARIZONA: Post Creek Canyon, Pinaleno Mts., Fort Grant, 15-18 July 1917 (JB) (MCZ, no. 17, 028)]. New synonym.

Aporus (Aporus) bequaerti Bradley, 1944, Trans. Amer. Ent. Soc., 70: 95 (in part).

Aporus (Aporus) yavapai Bradley, 1944, *ibid.*, pp. 95-96.

Aporus (Aporus) pulchritarsis Bradley, 1944, *ibid.*, p. 97 (listed as unrecognizable).

Melanaporus notabilis Evans, 1951, U. S. Dept. Agri., Monogr. no. 2, p. 922 (♂, Arizona; misidentification).

Although Bradley indicated that the vertex is not sharply margined in *yavapai*, I can discern no difference in this regard from the types of *bequaerti* and *pulchritarsis*. The spots on the second tergite of the type of *yavapai* are small but clearly evident, as they are in a female from Nayarit. A specimen from the Chiricahua Mts., Arizona, has the spots extremely weak and barely noticeable, while in the other available females they are altogether absent. Yet the males are always fully maculated, in fact more so than in the Guatemala male of *n. notabilis* mentioned above.

Description of type female.—Length 15 mm.; fore wing 12 mm. Color black, sides of lower front silvery-sericeous, pubescence otherwise strongly bluish to violaceous, including the legs; wings fuscous, violaceous. Erect setae numerous on mandibles, clypeus, front, and front coxae; femora and middle and hind coxae each with a few setae. Clypeus 3 X as broad as high. MID .66 X TFD, .82 X HE; UID 1.17 X LID. POL:OOL=9:8; posterior ocelli removed from vertex crest by about their own diameters. Vertex, in anterior view, passing straight across between eye tops; crest of vertex rather sharp. Pronotal disc .8 X as long as its maximum width, 1.35 X as long as meso-scutum. Front femora strongly incrassate, measuring 1.95 X as long as wide. Fore wing with marginal cell removed from wing tip by 1.2 X its own length; SMC2 2.3 X as wide as high, narrowed by somewhat less than half above, the second intercubital vein straight, slightly oblique.

Male. — Length 7-11 mm. Color as described for *n. notabilis*; wings hyaline, fore wing with a dark band along the outer margin. Pubescence extensively silvery, coarse and semi-erect on propodeal declivity, somewhat violaceous at least on sides of propodeum. Eyes tending to converge more above than in *n. notabilis*, UID .86-.93 X MID; punctures of front all very minute, front scarcely impressed at upper eye margins and ocelli as described for the nominate subspecies. Antennae as in *n. notabilis*, segments 4-12 each measuring from 1.20 to 1.45 X as long as thick. Propodeum rather high and weakly sloping in front, with a fairly well defined declivity behind. Terminalia as in the other two subspecies.

Distribution. — Southern Arizona to Oaxaca. (Map 10.)

Specimens examined. — 8 ♀♀, 11 ♂♂. ARIZONA: 1 ♂, West slope Patagonia Mts., Santa Cruz Co., 9 Aug. 1955 (Butler & Werner) [MCZ]; 1 ♂, 25 mi. NE of Tucson, 4500 feet, 12 Aug. 1946 (HAS) [OSU]; 1 ♀, Post Creek Canyon, Pinaleno Mts., 15-18 July 1917 (JB) [MCZ]; 1 ♀, 5 mi. W. Portal, Chiricahua Mts., 22 Aug. 1958 (R. M. Bohart) [UCD]; 1 ♀, Sycamore Canyon, nr. Ruby, 16 Aug. 1961 (JB) [UA]; 1 ♀, Peña Blanca, Santa Cruz Co., 17 Aug. 1961 (JB) [UA]. CHIHUAHUA: 1 ♀, Catarinas, 5800 feet, 25 July 1947 (CDM) [AMNH]; 1 ♂, Santa Clara Canyon, 5 mi. W. Parrita, 6 July 1954 (JWM) [CIS]. DURANGO: 3 ♂♂, San Juan del Rio, 7 Aug. 1951 (PDH) [CIS, MCZ]. ZACATECAS: 1 ♀, 15 km. E Sombrerete, 28-31 July 1951 (PDH) [CIS]. NAYARIT: 1 ♀, 28 mi. SE Tepic, 26 Aug. 1959 (AM & LS) [UCD]. MORELOS: 1 ♂, 3 mi. NW Cuernavaca, 6500 feet, 26 June 1959 (HEE) [MCZ]; 2 ♂♂, Canyon de Lobos, near Yautepec, 4000 feet, 25 May 1959 (HEE) [CU, MCZ]; 1 ♂, Cuernavaca, May 1945 (Krauss) [USNM]. GUERRERO: 1 ♀, Chilpancingo, June (HHS) [BMNH]. OAXACA: 1 ♂, Arroyo del Chile, 20 Aug. 1959 (LS & AM) [UCD].

Intergrades between n. notabilis and n. pulchritarsis. — SAN LUIS POTOSI: 1 ♂, Xilitla, 23 July 1954, 1450 feet [KU]. HIDALGO: 1 ♂, Chapulhuacan, 20 May 1952 (WG) [AMNH]. YUCATAN: 1 ♀, Chichen Itza, June 1929 (JB) [MCZ].

Variation. — The available females vary somewhat in size (fore wing from 9.5 to 14 mm.). Three Arizona specimens and one from Nayarit have small whitish spots on the sides of T2, though the spots are exceedingly small in the Arizona specimens; the other four specimens are all black.

The female from Yucatan (type of *bequaerti*) is here considered

an intergrade between *n. notabilis* and *notabilis pulchritarsis*. In structure it is a typical *notabilis* although smaller than average and with a broader than average head (fore wing only 7 mm.; head 1.17 X as wide as high). In color it is wholly black. It is of course possible that this specimen represents a distinct species, but this seems to me unlikely. Males from Hidalgo and from southeastern San Luis Potosi appear to be intergrades between these same two subspecies. Both of these are large specimens (fore wing about 10 mm.) and have the wings clouded over the basal vein and again over the marginal cell, in addition to the apical band. In these two specimens the propodeum is shaped as in *pulchritarsus*, but the eyes more markedly convergent above and the punctures of the upper front quite distinct, as in *notabilis*.

Aporus (*Aporus*) *notabilis prolongatus* new subspecies

Aporus (*Aporus*) *bequaerti* Bradley, 1944, Trans. Amer. Ent. Soc., 70: 95 (in part; records from Tamaulipas and Texas). — Evans, 1958, Ent. News, 69: 149-151 (description of male).

Females from Texas and northeastern Mexico formerly identified as *bequaerti* differ in several important ways from the type of that species. The males have no whitish maculations at all (except for the spurs) and hence contrast strongly to the males of *pulchritarsis* and *notabilis*. However, the terminalia seem to me identical in the three forms, and a male intergrade between *prolongatus* and *n. notabilis* is known (see below).

Holotype. — ♀, TEXAS: Cameron Co., Port Isabel, 23-27 June 1956 (on flowers of *Avicennia nitida*, Evans and Matthews) [MCZ, no. 30, 959].

Description of type female. — Length 14 mm.; fore wing 10.5 mm. Color black; pubescence silvery on sides of lower front and clypeus, elsewhere strongly reflecting bluish; wings fuscous, violaceous. Body with sparse, short erect setae on front, thoracic dorsum, coxae, and to a limited extent on femora. Clypeus 3.1 X as wide as high. Head 1.06 X as wide as high; MID .65 X TFD, .83 X HE; UID 1.21 X LID, the eyes thus strongly divergent above. POL: OOL=3:2; ocelli in a very broad triangle, posterior ocelli removed from vertex crest by less than their own diameters, crest of vertex rather sharp. Pronotal disc unusually long and parallel-sided, its median length equal to its greatest width; length of disc nearly twice that of mesoscutum. Propodeum rather long, with a well-defined declivity. Front femora strongly incrassate,

measuring twice as long as wide. Fore wing with the marginal cell about its own length from the wing tip; SMC2 about twice as wide as high.

Allotype. — ♂, TEXAS: same data as type [MCZ].

Description of allotype male. — Length 9 mm.; fore wing 8.5 mm. Black, except front tibial spurs light brown, remaining spurs white; entire body clothed with coarse silvery pubescence, that on the propodeal declivity long and semi-erect; wings hyaline, fore wing with a weak apical fuscous band. Whitish erect setae are present on the scape, front, temples, thorax, and front coxae. Clypeus 1.7 X as wide as high, its apex rounded. MID .64 X TFD; eyes divergent above, UID 1.24 X LID, .92 X MID. POL:OOL=3:2; punctures of front very minute, front not impressed along upper eye margin and less so about ocelli than in *n. notabilis*. Antennal segments 4-12 each about 1.65 X as long as thick. Propodeum rather long, flat in front and steeply declivous behind. Emargination of S6 deep, U-shaped. SGP with a median elevation, tapering to a subacute apex. Genitalia with the parameres shorter than the digiti, obliquely truncate apically, bearing some long, simple setae; volsella with simple, relatively short setae at the base and on the digitus, the latter slender and strap-shaped; aedoeagus shorter than the digiti and parapenial lobes. (The terminalia have been figured by Evans, 1958.)

Distribution. — Texas and Durango to Veracruz. (Map 10.)

Paratypes. — TEXAS: 1 ♀, 3 ♂♂, same data as type except one ♂ taken 20-23 June 1948 (HEE) [MCZ, CU, USNM]; 1 ♂, 5 mi. N Sinton, 7 May 1958 (HEE) [MCZ]; 1 ♀, Brownsville, 17 April 1895 (C.H.T. Townsend) [USNM]. TAMAULIPAS: 1 ♀, Reynosa, 20 May 1895 [ANSP]. NUEVO LEON: 3 ♂♂, Vallecillo, 2-5 June 1951 (HEE) [CU, MCZ]. DURANGO: 1 ♂, 14 mi. NW Ceballos, 4100 feet, 10 Sept. 1963 (HAS) [OSU]. VERACRUZ: 2 ♀♀, 5 mi. NE Tinajas, 18 Aug. 1963 (FDP, LS) [UCD].

Intergrade between n. prolongatus and n. notabilis. — SAN LUIS POTOSI: 1 ♂, Ciudad del Maiz, 23 Aug. 1954 (RRD) [MSU].

Variation. — The female paratypes are all smaller than the type (fore wing 8.5-10 mm.), but there are no important structural differences. The males vary greatly in size (fore wing 6-11 mm.); the smaller specimens tend to have the fore wing less distinctly banded along the apical margin, and also to have relatively shorter antennae. In some specimens the apical abdominal tergite is suffused with whitish. None of these specimens show any evidence of maculations on the pronotum, tibiae, or basal abdominal tergites. Variation in standard measurements is not great.

The male from San Luis Potosi listed as an intergrade with *n. notabilis* is in fact a perfect intermediate in coloration, having a white band on the pronotum and a white apical tergite, as in *n. notabilis*, but lacking other white spots on the abdomen. That it is an intergrade with *notabilis* rather than with *pulchritarsis* is suggested by the relatively even slope of the propodeum and the rather strong punctures of the front.



Aporus (Aporus) idris idris (Cameron) new combination

Pompilus idris Cameron, 1897, Ann. Mag. Nat. Hist., (6) 19: 375 [Type: ♀, MEXICO: VERACRUZ: Atoyac, April (HHS) (BMNH, no. 19, 763)].

— Cameron, 1899, Biol. Centr.-Amer., Hymen. II, Suppl., p. 404.

Aporus (Aporus) zapotecus Bradley, 1944, Trans. Amer. Ent. Soc., 70: 96 [Type: ♂, MEXICO: OAXACA: Tuxtepec, Oct. 1933 (M. Fraire) (USNM, no. 57, 934)]. New synonym.

Odontaporus aureolus Bradley, 1944, *ibid.*, pp. 115-116 [Type: ♀, MEXICO: MEXICO: "San Rafael Jicoltepec" (? = Jilotepec) (USNM, no. 57, 939)]. New synonym.

This remarkable species of *Aporus* has evolved a color pattern strikingly like that of certain species of *Psorthaspis*, particularly

variegata Smith and *formosa* Smith; presumably these species form a Müllerian mimetic complex. The type of *idris* is a rather small, faded specimen, but there is no question that Cameron's species is the same as Bradley's *aureolus*. Bradley's *zapotecus* male has been taken at the same time and place as *idris* on two occasions, and furthermore there is no other female *Aporus* with which it might be associated.

Female. — Length 8-12 mm. Black, T2 with a pair of large white spots, T4 wholly light orange-brown, T5 also of this color except sometimes at apical margin, apical tergite sometimes pale at base and/or apex; pubescence extensively silvery or somewhat glaucous, but dense and conspicuously orange on the front, vertex, posterior part of pronotum and all of mesoscutum; pubescence of scutellum, metanotum, and a semicircular area on front of pronotum nearly black. Fore wing conspicuously twice-banded, both bands broad but the basal band not invading the costal cell, the apical band not reaching the outer wing margin; setulae of wing with a golden sheen in the hyaline areas, especially between the two dark bands; hind wings hyaline, their apices infuscated. Lower margin of mandibles with a small tooth. Clypeus rather flat, truncate apically, 2.5 X as wide as high. Inner orbits diverging above, UID 1.2 X LID; vertex passing straight across between eye tops. POL and OOL subequal; posterior ocelli removed from vertex crest by slightly more than their own diameter. Pronotal disc about 1.7 X as long as mesoscutum. Propodeum short, with transverse rugae on sides of declivity. Front femora slightly incrassate, measuring about 2.5 X as long as wide. Fore wing with SMC2 about twice as broad as high, narrowed by about half above. Hind wing with anal vein arching up to meet median vein a short distance before origin of cubitus.

Male. — Length 6-8 mm. Black, posterior margin of pronotum with a whitish band, apex of abdomen also whitish; pubescence conspicuously silvery to glaucous over most of body. Wings hyaline, apical third to a fourth of fore wing clouded, some specimens also with a cloud over the basal and transverse median veins. Clypeus 1.7 X as wide as high, its apical margin weakly rounded. Inner orbits strongly divergent above, UID about 1.5 X LID. POL and OOL nearly equal, the ocellar triangle rather broad, the vertex slightly gibbous within the ocelli triangle. Antennae rather short, segments 4-12 each 1.05-1.2 X as long as thick. Claws bifid; inner claw of front tarsus more strongly curved than outer; longer spur of hind tibia about .8 the length of the basitarsus. SGP rather slender, apex narrowly rounded, the plate strongly tectiform. Genitalia with the parameres, basis volsellaris, and digiti all bearing strong clubbed setae; parameres short, apex subtruncate; digiti much exceeding the parameres but exceeded by the parapenial lobes and the aedoeagus; parapenial lobes with a short but strong apical expansion (fig. 27).

Distribution. — Central and southern Mexico; British Honduras. (Map 11.)

Specimens examined. — 8 ♀♀, 27 ♂♂. OAXACA: 1 ♂, Tuxtepec, Oct. (M. Fraire) [USNM]. VERACRUZ: 1 ♀, Atoyac, April (HHS) [BMNH]; 1 ♀, 2 ♂♂, Cordoba, 1 January 1941 (GEB) [CAS, MCZ]. MEXICO: 1 ♀, Jilotepec [USNM]. MORELOS: 1 ♀, 1 ♂, Cuernavaca, March, April 1959 (HEE) [MCZ]; 2 ♀♀, 3 mi. NW Cuernavaca, 6500 feet, May, June 1959 (HEE) [USNM, CU]; 1 ♀, 5 mi. E Cuernavaca, 28 Mch. 1962 (LS) [UCD]; 1 ♀, 16 ♂♂, Canyon de Lobos, nr. Yautepec, 13 March 1959 (HEE) [MCZ, CU, CIS, USNM]; 6 ♂♂, 3 mi. N Alpuyeca, 3 April 1959 (HEE) [MCZ, CU]. BRITISH HONDURAS: 1 ♂, Augustine Mt. Pine Ridge, 3-7 July 1963 (CCP) [MCZ].

Aporus (*Aporus*) *idris comptus* (Bradley) new combination

Odontaporus comptus Bradley, 1944, Trans. Amer. Ent. Soc., 70: 116 [Type: ♀, PANAMA: Cabina, 21 May 1911 (A. Busck) (USNM, no. 57, 940)].

The one known female of this form differs but slightly from *idris*, and the one presumed male differs scarcely at all. Whether *comptus* can be maintained as a distinct subspecies permanently is doubtful, but until specimens are collected from the countries between Mexico and Panama Bradley's name may as well be employed.

Female. — Differs from *idris idris* in having the distance from the posterior ocelli to the vertex crest equal to slightly less than the diameter of the ocelli, also in having T5 black (although apparently orange-brown basally where it is overlapped by T4).

Male. — Resembles the male *idris idris* closely in every respect, including all details of the terminalia. The one available specimen has the wings slightly darker than in most males from Mexico before me: the apical two-thirds of the fore wing is lightly infuscated, with darker areas over the basal vein and in and below the marginal cell.

Distribution. — Known only from Panama. (Map 11.)

Specimens examined. — 1 ♀, 1 ♂. PANAMA: 1 ♀, Cabina [type, USNM]; 1 ♂, Barro Colorado Island, Canal Zone, 8 March 1956 (CWR) [KU].



Subgenus **PLECTRAPORUS** Bradley

Aporus (Plectraporus) Bradley, 1944, Trans. Amer. Ent. Soc., 70: 97-100
[Type species: *Planiceps hirsutus* Banks, monobasic].

Subgeneric characters. — Female. Inferior margin of mandibles not dentate. Clypeus a very short, transverse band. Antennal sockets low, on a level with bottoms of eyes. Malar space long, longer than second antennal segment and about two thirds as long as third. Eyes narrow, reaching vertex, not hairy. Vertex slightly concave as seen from in front, strongly concave as seen from above. Front tarsi with a series of short, rather wide comb-spines, those at the apices of segments 1-3 especially strong. Venation of hind wing as in *Neoplaniceps*. Body and legs very hairy, the occiput and collar especially densely hairy.

Male. Claws dentate, the tooth sloping outward somewhat; inner claws of front tarsus strongly curved, strongly bifid. SGP strongly compressed; genitalia with the parameres relatively broad, with a series of setae extending obliquely along the ventral surface, margins without setae.

Distribution. — Western United States and Baja California.

Included species. — Only the type species.

Aporus (Plectraporus) hirsutus (Banks)

Planiceps hirsutus Banks, 1917, Bull. Mus. Comp. Zool., 61: 99 [Type: ♀, CALIFORNIA: Pasadena, Aug. 1903 (MCZ, no. 10, 008)]. — Banks, 1919, Bull. Mus. Comp. Zool., 63: 242. — Williams, 1928, Bull. Exp. Sta. Hawaiian Sugar Planters' Assoc., Ent. Ser., 19: 135-140 (biology).

Aporus (Plectraporus) hirsutus Bradley, 1944, Trans. Amer. Ent. Soc., 70: 99 (Calif., Nev.). — Evans, 1951, U. S. Dept. Agri. Monogr. 2, p. 922. — Krombein, 1958, U. S. Dept. Agri. Monogr. 2, Suppl., p. 179 (Ariz.)

Female. — Length 6.5-12.5 mm. Black; body, legs, and fore wing rendered by the pubescence a rather brilliant bluish, or sometimes greenish or violaceous; fore wing fuscous, hind wing more lightly infuscated. Antennae very short. Pronotum very long, nearly parallel-sided, its disc approximately as long as wide. Front femora strongly swollen, measuring 2.0-2.3 X as long as wide. Body and legs very hairy, the amount of hair somewhat variable, most specimens even with a few erect hairs on the basal tarsal segments.

Male. — Length 3-8 mm. Black; color of pubescence very variable, sometimes almost wholly bluish or violaceous, in other specimens extensively brownish and/or silvery; wings hyaline to moderately infuscated, fore wing with a darker marginal band. Antennae moderately elongate, segments 4-12 each 1.2-1.5 X as long as wide. Longer spur of hind tibia .7-.8 the length of the basitarsus. Terminalia as described under subgenus; genitalia figured by Bradley, 1944, pl. IV, fig. 19.

Distribution. — Oregon and Idaho to Arizona and Baja California. The species has not previously been recorded from the first two states, but there are specimens in the MCZ from Tumalo, Ore., and specimens in the University of Idaho collection from Shoshone, Idaho. In Arizona the species is not known to occur east of Topoc and Phoenix. (Map 8.)

Mexican specimens examined. — 16 ♀♀, 1 ♂. BAJA CALIFORNIA: 13 ♀♀, Descanso, 1 Sept. 1955 (RMB) [UCD, MCZ]; 1 ♂, Sierra San Pedro Martir, La Grulla, 6500 feet, 1 June 1958 (JP) [CIS]; 1 ♀, El Progreso, Sierra Juarez Mts., 10 Sept. 1958 (Truxal and Northern) [LACM]; 2 ♀♀, Cabo San Lucas, 16 March 1953 (P. H. Arnaud) [CAS].

Genus **CHELAPORUS** Bradley

Chelaporus Bradley, 1944, Trans. Amer. Ent. Soc., 70: 116-118 [Type species: *Pedinaspis anomala* Banks, monobasic and original designation].

Generic characters. — Female. Length 9-16 mm. Color black. Mandibles with two small teeth on inner margin; lower margin not dentate. Clypeus not quite as wide as lower front, rather flat, its upper and lower margins subparallel. Antennal sockets slightly above bottoms of eyes. Eyes not hairy. Vertex extending slightly above eye tops and well above posterior ocelli. Pronotum moderately long, anteriorly descending gradually to slightly lower plane of collar. Postnotum concealed dorsally; propodeum without rugae. Middle coxae well separated from one another, also the hind coxae, leaving a fairly broad sternal plate between them. Front femora slightly incrassate; claws dentate. Fore wing with SMC2 large, much narrowed above by the convergence of the intercubital veins, receiving both recurrent veins, the second at a considerable distance from the apex. Hind wing with the anal vein straight, the transverse median vein leaving it at an angle and reaching the median vein well basad of the origin of the cubitus; transverse median vein slightly arched (fig. 4).

Male. Length 5-9 mm. Color black, the wings hyaline. Mandibles with a single large tooth on the inner margin. Anterior margin of clypeus weakly convex. Vertex distinctly humped in the ocellar triangle. Front tarsal claws bifid, the inner ones much more curved than the outer ones; remaining claws dentate, but the tooth sloping outward slightly; last segment of front tarsus symmetrical. Wing venation as in female. SGP slender, keeled, its apex deeply cleft. Genitalia of unusual form, the parameres very large, greatly expanded apically; digiti wholly covered with small setae, exceeding the rather small parapenial lobes; aedoeagus very small.

Distribution. — Eastern and Central Mexico to Texas.

Included species. — Only the type species, *anomalus* (Banks).

Remarks. — This striking genus departs considerably from other Aporini, particularly with respect to the thoracic venter of the female and the terminalia of the male. The large second submarginal cell and the distinct transverse median vein of the hind wing suggest that the genus may have evolved from a primitive stock of Aporini.

Chelaporus anomalus (Banks)

Pedinaspis anomala Banks, 1917, Bull. Mus. Comp. Zool., 61: 100 [Type: ♀, TEXAS: Coryell Co. (G. Birkmann) (MCZ no. 10, 010)].

Chelaporus anomalus Bradley, 1944, Trans. Amer. Ent. Soc., 70: 117-118. — Evans, 1951, U. S. Dept. Agri., Monogr. 2, p. 922.

Female. — Length 9-16 mm. Black, wholly covered with brilliant dark bluish or blue-green pubescence; fore wings fuscous, with weak coppery reflections; hind wings subhyaline. Erect hairs sparse, short and inconspicuous except on temples, front coxae, and tip of abdomen; front femora slightly hairy; propodeum not hairy. Inner orbits diverging above, UID much ex-

ceeding LID; ocelli in a broad triangle, posterior ocelli far removed from vertex crest. Vertex not sharp, elevated somewhat above eye tops, as seen from in front slightly concave on the midline. Front femora about 2.7 X as long as wide. SMC2 2.5 X as wide as high, narrowed by about two thirds above (fig. 4). Abdomen weakly compressed, first tergite strongly convex, its anterior face nearly vertical.

Male. — Length 5-9 mm. Black, entirely covered with fine silvery pubescence; erect setae largely absent except on propleura; wings hyaline, membrane and setulae rather pale, veins brown. Clypeus about twice as broad as high. Inner orbits diverging strongly above. Antennae rather compact, segments 4-12 each about 1.2 X as long as wide, as seen from inner side slightly imbricate. Ocelli unusually small, posterior ocelli not close to vertex crest. Legs not very spinose; longer spur of hind tibia .75 X length of basitarsus. Venation as in female except SMC2 tending to be somewhat shorter (2.0-2.4 X as wide as high). Terminalia as described under generic diagnosis and as figured by Bradley, 1944, pl. IV, figs. 6 and 9-11.

Distribution. — States of Veracruz and Mexico north to Chihuahua and to central Texas. (Map 12.)

Specimens examined. — 24 ♀♀, 18 ♂♂. VERACRUZ: 1 ♂, La Gloria Cardel, Jan. 1938 (J. Camelo) [USNM]; 1 ♀, 2 ♂♂, Veracruz, 20 June 1951 (HEE, PDH) [MCZ, CIS]. MEXICO: 3 ♀♀, "San Rafael Jicoltepec" (? = Jilotepec) [USNM, ANSP]. DURANGO: 2 ♂♂, 14 mi. NW Ceballos, 4100 feet, 10 Sept. 1963 (HAS) [OSU]; 1 ♀, 8 mi. S Canutillo, 9 Aug. 1951 (PDH) [CIS]. SINALOA: 2 ♂♂, 8 mi. S Elota, 2 July 1963 (FDP, LS) [UCD]. CHIHUAHUA: 1 ♀, Catarinas, 5800 feet, 25 July 1947 (MC) [AMNH]; 1 ♀, 2 ♂♂, 16 mi. SE Chihuahua, 11 July 1947 (MC) [AMNH]. NUEVO LEON: 1 ♀, 50 mi. SE Monterrey, 1700 feet, 13 Oct. 1957 (HAS) [OSU]; 1 ♂, Vallecillo, 2-5 June 1950 (HEE) [MCZ]. TAMAULIPAS: 1 ♀, 2 mi. N El Limon, 7 June 1961 [KU]. TEXAS: 3 ♀♀, Los Almos Creek, Kenedy Co., 18 June 1949 (HEE) [MCZ]; 3 ♀♀, 4 ♂♂, 5 mi. N Sinton, 7 May 1958 (HEE) [CU, MCZ]; 1 ♂, Gillette, 25 July 1917 [MCZ]; 1 ♀, Coryell Co. [type, MCZ]; 4 ♀♀, 5 mi. W Cypress Mills, Blanco Co., 4 July 1949 (HEE) [MCZ, CU]; 1 ♀, Bastrop State Park, Bastrop Co., 19 June 1956 (HEE) [MCZ]; 1 ♂, Fedor, Lee Co., 27 May 1904 (G. Birkmann) [MCZ]; 1 ♀, Bexar Co., 11 Sept. 1931 [CAS]; 1 ♀, 1 ♂, Llano Co., June, July [MCZ]; 1 ♂, 3 mi. E Presidio, 1-3 May 1963 (HEE) [MCZ].



Genus ALLAPORUS Banks

Allaporus Banks, 1933, Psyche, 40: 2 [Type species: *Planiceps pulchella* Banks, original designation]. — Bradley, 1944, Trans. Amer. Ent. Soc., 70: 118-121. — Evans, 1950, Ent. News, 61: 1-5. — Evans, 1953, Jour. Kansas Ent. Soc., 26: 26-31 (Mexican spp.).

Generic characters. — Female. Length 3-9 mm. Black, often partly rufous. Mandibles with two small teeth on inner margin; lower margin not dentate. Clypeus not as wide as LID. Antennal sockets slightly above a line drawn between bottoms of eyes. Eyes not hairy. Pronotum moderately long. Propodeum with a well-defined, rather flat, oblique declivity. Front femora not or slightly incrassate. Claws dentate. Fore wing with marginal cell slender and acute; two SMCs present, the second receiving both recurrent veins. Hind wing with transverse median vein leaving anal vein at an angle, reaching median vein far basad of origin of cubitus; anal lobe slender, deeply separated from remainder of wing (fig. 5).

Male. Length 2.5-8 mm. Entirely black. Mandibles with two small teeth on inner margin. Claws dentate except inner claws of front tarsi bifid; apical segment of front tarsus symmetrical. Wing venation as in female. Abdomen compressed apically, SGP compressed. Genitalia with parameres shorter than digiti, more or less truncate apically; digiti simple, with small setae; basal hooklets single; parapenial lobes strong, compressed; aedoeagus very slender.

Distribution. — Southern Mexico to southern United States (north to Pennsylvania and to Oregon).

Included species. — This genus is now known to include eight species, all of which are considered below. Most of the species are rare in collections, and it is probable that other species remain to be discovered.

Remarks. — This is a genus of minute wasps which probably attack some type of small, burrowing spider. These wasps are almost never taken on flowers, but they sometimes come to honeydew in considerable numbers. The males are especially difficult to separate, and the key presented below for this sex is far from satisfactory. In the past few years I have accumulated fairly good series of males of several species, and study of these convinces me that the genitalia are of very limited value in separating species. Characters such as those I discussed and figured in 1953 seem subject to much intra-specific variation, particularly the shape of the parameres.

The key which follows includes all known species of *Allaporus*; all of them probably occur in Mexico, but at present two are known only from southwestern United States. Of the eight species, one is known from the female only, one from the male only.

Key to Species

Females

1. Fore wings not twice banded, though often darker on apical third than basally; abdomen not banded 2
- Fore wings conspicuously twice-banded, one band or spot over the basal vein, another covering much of the apical third of wing; abdominal tergites (at least in part) obscurely dark-banded apically 5
2. Fore wings wholly fuscous, violaceous; body wholly black, rendered by the pubescence a rich, deep blue; body and legs with numerous dark erect setae *toltecus* Evans
- Fore wings lightly infuscated on basal half or more, not violaceous; abdomen usually rufous, body in any case not rendered bluish by the pubescence; body setae very sparse and inconspicuous, legs (except front coxae) without setae 3
3. Mandibles relatively short and broad, apical half obliquely flattened and polished; clypeus rather flat, only about twice as broad as high; crest of vertex rather sharp *smithianus* (Cameron)

- Mandibles more elongate and not modified as above; clypeus slightly convex, 2.5-3 X as broad as high; crest of vertex not especially sharp 4
4. First abscissa of radius of hind wing very short and nearly vertical (fig. 5); first abscissa of cubitus of hind wing forming nearly a straight line with intercubital vein; propodeum without rugae; size small, fore wing measuring 2.5-4.5 mm. *pulchellus* (Banks)
- First abscissa of radius of hind wing longer and more arched; first abscissa of cubitus longer, strongly arched before its junction with intercubital vein; propodeum weakly transversely rugose; size larger, fore wing measuring 4.2-6.2 mm. *rufiventris* (Cresson)
5. Abdomen black, with silvery pubescence except tergites banded with darker pubescence preapically; hind wing with first abscissa of cubital vein forming nearly a straight line with intercubital vein *elegantulus* Evans
- Abdomen in large part rufous; hind wing with first abscissa of cubitus distinctly arched before its junction with intercubital vein 6
6. Outer band of fore wing covering entire outer third of wing; pubescence of head and thorax silvery, grading into light brown dorsally; clypeus 1.8 X as broad as high, rather flat, subrectangular *fascipennis* Evans
- Outer band of fore wing not reaching outer margin, which is narrowly subhyaline; head and thorax with conspicuous golden pubescence; clypeus 2.7 X as broad as high, its sides oblique, somewhat rounded *aurulentus* new species

Males

1. Relatively large, dark species; fore wing at least 5 mm.; wings lightly to moderately infuscated; pubescence dark over a considerable part of the body; SGP relatively broad, rounded apically 2
- Relatively smaller and more lightly colored species; fore wing rarely as much as 5 mm. long; pubescence silvery, cinereous, or light brown over most of body; wings subhyaline to hyaline, sometimes clouded apically 3
2. Pubescence in large part bluish-refulgent; front, thoracic dorsum and pleura, propodeum, and basal parts of legs with numerous dark erect setae *toltecus* Evans
- Pubescence not at all bluish; body setae very much sparser and less conspicuous than above, propodeum not at all hairy *fumipennis* n. sp.
3. Antennae extremely compact, not more than about twice as long as TFD, segments 4-12 each not or but slightly longer than thick; wings almost clear hyaline 4
- Antennae more elongate, more than twice as long as TFD, segments 4-12 each about 1.2-1.4 X as long as thick; fore wings more or less clouded apically 5

4. Crest of vertex rather sharp, posterior surface of head flat or somewhat concave; SGP very slender and attenuate apically *smithianus* (Cameron)
Crest of vertex not at all sharp, head not concave or especially flat behind; SGP less attenuate than above *rufiventris* (Cresson)
5. First abscissa of cubitus of hind wing forming nearly a straight line with the intercubital vein, which slopes strongly; apical fourth of digiti largely devoid of setae *pulchellus* (Banks)
First abscissa of cubitus of hind wing long and strongly arched before meeting the intercubital vein, which is more erect; fore wing often with a very weak spot over the basal vein 6
6. Wings completely hyaline; second submarginal cell quadrangular although narrowed above *fascipennis* Evans
Fore wing distinctly clouded apically; second submarginal cell triangular or nearly so *aurulentus* n. sp.

Allaporus toltecus Evans

Allaporus toltecus Evans, 1953, Jour. Kansas Ent. Soc., 26: 31 [Type: ♂, MEXICO: MEXICO: Teotihuacan Pyramids, 7500 feet, 15 June 1951 (PDH) (CAS)].

This species was described from a single male. I have since collected a female which undoubtedly belongs to the same species. Both sexes are readily recognized by the bluish pubescence and the abundant dark setae.

Plesiallotype. — ♀, MEXICO: MORELOS: 4 mi. E Cuernavaca, 6000 feet, 25 June 1959 (HEE) [MCZ].

Description of plesiallotype female. — Length 8.8 mm.; fore wing 7 mm. Body and legs black, rendered by the pubescence a rich, dark bluish; mandibles mostly rufous; fore wings wholly fuscous, violaceous; hind wings subhyaline basally, somewhat infuscated apically. Temples, propleura, and front coxae with abundant dark setae; front, vertex, thoracic dorsum and pleura, propodeum, and middle and hind coxae sparsely short-setose; front femora with a few short setae; abdomen sparsely setose ventrally and apically. Mandibles relatively slender, unmodified, with two small teeth on the inner margin. Clypeus 2.5 X as wide as high, apex subtruncate, with a narrowly elevated, shining margin. Head 1.1 X as wide as high; MID .66 X TFD, 1.12 X LID, .90 X HE; UID .87 X LID. POL:OOL = 13:10; distance from posterior ocelli to vertex crest .7 X POL. First four antennal segments in a ratio of about 26:6:14:17, segment three twice as long as thick, .3 X UID. Vertex passing nearly straight across between tops of eyes, not at all sharply margined; spatium frontale prominent, perpendicularly declivous between antennal sockets. Pro-

notal disc .65 X as long as wide, 1.5 X as long as mesoscutum. Propodeum relatively short and with an oblique, nearly flat declivity, without a trace of rugae. Front femora not incrassate, measuring 3 X as long as wide; longer spur of hind tibia .55 X as long as basitarsus. Fore wing with basal vein arising slightly basad of transverse median vein, its lower section strongly arched; SMC2 1.6 X as wide as high, narrowed by .6 above. Hind wing with first abscissa of cubitus long and strongly arched before junction with intercubital vein, first abscissa of radial vein also relatively long and arcuate before meeting intercubital vein. Apex of abdomen moderately compressed.

Male. — Length 6 mm. Black; wings lightly, rather evenly infuscated. Pubescence in large part reflecting dark bluish, on the lower head, sides of the thorax, coxae, and posterior slope of the propodeum silvery. Body with dark erect setae distributed much as in female. Front broad, eyes divergent above, UID 1.2 X LID; POL and OOL subequal. Third antennal segment 1.2 X as long as thick. Wings about as in female. SGP moderately broad; genitalia with the parameres considerably shorter than digiti, the latter with very small setae.

Distribution. — Central Mexico, 6000 to 7500 feet. (Map 13.)

Specimens examined. — 1 ♀, 2 ♂♂. MEXICO: 2 ♂♂, Teotihuacan Pyramids, 7500 feet, June, Aug. (PDH, RRD) [CAS, MSU]. MORELOS: 1 ♀, 4 mi. E Cuernavaca; 6000 feet, June (HEE) [MCZ].



Allaporus fumipennis new species

Holotype. — ♂, MEXICO: CHIAPAS: San Cristobal de las Casas, 25 April 1959, 7500 feet elevation (HEE) [MCZ, no. 30, 960].

Description of type male. — Length 6 mm.; fore wing 5 mm. Entirely black; pubescence brownish, non-metallic, inconspicuous, grading into silvery on lower p'leura, coxae, posterior half of propodeum, and basal parts of basal abdominal tergites. Front, vertex, temples, propleura, and thoracic dorsum very sparsely short-setose. Fore wing wholly moderately infuscated except basal cell subhyaline and with a hyaline streak extending irregularly downward from base of stigma; hind wing subhyaline. Mandibles slender, unspecialized. Clypeus about twice as broad as high, margin truncate. Head 1.12 X as wide as high; front broad, MID .66 X TFD, 1.20 X LID, subequal to HE; UID 1.10 X LID. POL and OOL subequal; front angle of ocellar triangle greater than a right angle. First four antennal segments in a ratio of about 27:12:14:17, segment three 1.2 X as long as thick, segment four and following segments (except last) about 1.3 X as long as thick. Pronotum weakly obtusely angulate behind. Propodeum with unusually coarse sculpturing consisting of fine reticulations superimposed on an alutaceous background. Longer spur of hind tibia .9 the length of the basitarsus. Fore wing with basal vein arising well basad of transverse median vein, its lower section weakly arched; marginal cell slender, separated from wing tip by 1.35 X its own length; SMC2 1.5 X as broad as high, narrowed by two-thirds above. Abdomen slender, cylindrical. SGP very broad for the genus, its apex rounded. Genitalia with the parameres rather blunt, much shorter than the digiti, the latter covered with strong setae over most of their surface.

Paratype. — ♂, MEXICO: PUEBLA: 14 mi. E Huachinango, 17 June 1951 (HEE) [MCZ].

Variation. — The paratype is very similar to the type in size and structure. Aside from a small amount of silvery pubescence on the coxae, the entire body is brownish-pubescent, even the propodeal slope. The longer spur of the hind tibia measures .82 X the basitarsus. This specimen was described at greater length by me in 1953 (Jour. Kansas Ent. Soc., 26: 30), where it was misidentified as the male of *mexicanus*.

Distribution. — Known only from the two specimens cited above, both collected in openings in pine forest at moderately high altitudes. (Map 13.)

Allaporus smithianus (Cameron) new combination

Pompilus (*Aporus*) *smithianus* Cameron, 1893, Biol. Centr.-Amer., Hymen. II, pp. 191-192, pl. XI, fig. 9 [Type: ♀, MEXICO: VERACRUZ: Atoyac, May (HHS) (BMNH no. 19, 761)].

Allaporus amabilis Evans, 1950, Ent. News, 61: 2-3 [Type: ♀, CALIFORNIA: Potwisha, Tulare Co., 2 June 1929 (E. C. Van Dyke) (CAS)]. — Evans, 1953, Jour. Kansas Ent. Soc., 26: 30-31 (Texas, Durango, Zacatecas; description of ♂). New synonym.

The specialized mandibles of *smithianus* separate it from all other known species and suggest it may be a predator on some particular type of trap-door spider. The species is widely distributed but apparently uncommon. I have studied the type of *smithianus* and feel there is no question that Cameron's name is a senior synonym of *amabilis*.

Description of type female. — Length 7 mm.; fore wing 4.6 mm. Head and thorax black, abdomen wholly rufous except base of T1 black; greater part of mandibles and apical margin of clypeus rufous; legs black; fore wings moderately infuscated, slightly darker around basal vein and second intercubital vein, with an irregular pale streak passing from base of stigma nearly to posterior wing margin; hind wings subhyaline, slightly darker apically. Erect setae largely absent except for a few on the front coxae and the tip of the abdomen; pubescence silvery on lower front, sides of thorax, and entire propodeum, on sides of propodeum rather dense and conspicuous. Mandibles broad and short, lower margin roundly produced about midway, upper surface obliquely flattened and polished on apical half. Clypeus twice as broad as high, much narrower than face, its apical margin truncate, disc rather flat below. Head 1.15 X as broad as high; MID .62 X TFD, 1.05 X LID, .86 X HE; UID .75 X LID. POL:OOL=9:8, distance from posterior ocelli to vertex crest equal to about two-thirds X POL. First four antennal segments in a ratio of about 10:3:7:7, segment three .47 X UID. Vertex passing straight across a short distance above eye tops, crest of vertex rather sharp; front not strongly convex, spatium frontale not prominent. Pronotal disc .7 as long as its maximum width, 1.45 X as long as mesoscutum; disc elevated only slightly above collar. Propodeum with a rather abrupt, oblique declivity, surface with small, rather irregular rugae. Front femora not incrassate, 3.5 X as long as wide; longer spur of hind tibiae half as long as basitarsus. Fore wing with basal vein arising well basad of transverse median vein, lower section of basal vein strongly arched; marginal cell narrow, acute, separated from wing tip by 1.5 X its own length; SMC2 1.5 X as wide as high, narrowed by three-fourths above. Hind wing with first abscissa of cubitus rather long and strongly arched before its junction with the intercubital vein, the latter not strongly oblique. Apex of abdomen weakly compressed.

Male. — Length 4-5 mm. Black; wings clear hyaline or almost so; body pubescence extensively silvery; erect setae nearly absent. Mandibles relatively short, weakly obliquely flattened apically. Clypeus about twice as broad as high. Antennae very compact, segments 4-12 each 1.0-1.1 X as long as thick, entire antenna not more than about twice as long as TFD. Posterior ocelli removed from vertex crest by 1-2 X their own diameters, vertex crest relatively sharp, the posterior surface of the head flat or slightly concave. Longer spur of hind tibia as long as the basitarsus. Venation as in female. SGP very slender and attenuate. Genitalia with the digiti relatively slender, with rather strong setae except at extreme apex.

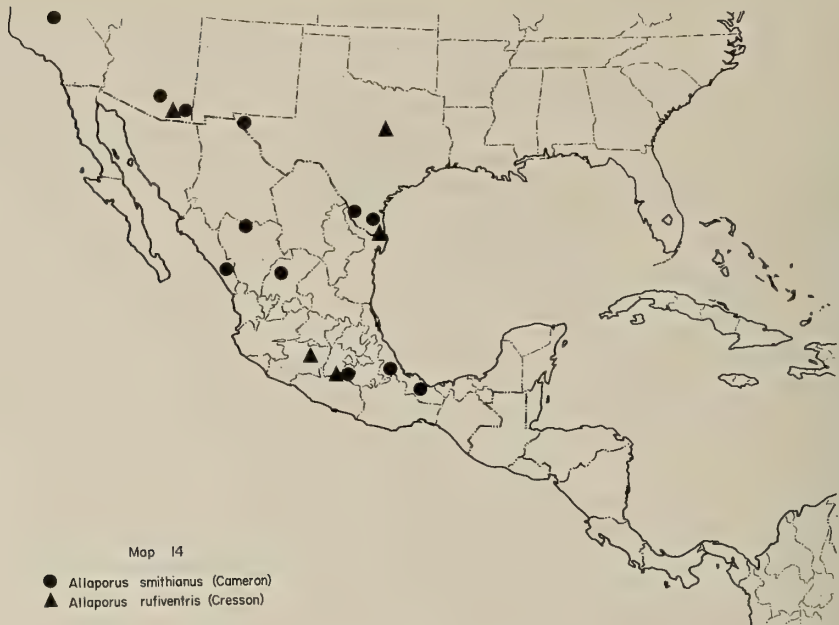
Distribution. — Central Mexico to southern Texas, Arizona, and California. (Map 14.)

Specimens examined. — 9 ♀♀, 3 ♂♂. VERACRUZ: 1 ♀, Atoyac, May (HHS) [type, BMNH]; 1 ♀, 30 mi. S Acayucan, 21 Apr. 1962 (FDP) [UCD]. MORELOS: 1 ♂, 2 mi. S Alpuyecan, 3000 feet, 19 June 1959 (HEE) [MCZ]. ZACATECAS: 1 ♂, 15 km. E Sombrerete, 28-31 July 1951 (PDH) [CIS]. DURANGO: 1 ♀, 8 mi. S Canutillo, 9 Aug. 1951 (HEE) [MCZ]. SINALOA: 1 ♀, 9 mi. E Chupaderos, 19 Mch. 1962 (FDP) [UCD]. TEXAS: 1 ♀, Laredo, 25 May 1944 [USNM]; 1 ♀, El Paso, 16 June 1944, "Mexico City via Monterrey, Anderson Field" [USNM]; 1 ♂, Brooks Co., 25 July (L. D. Beamer) [KU]. ARIZONA: 1 ♀, Cochise Co., 5 mi. W Portal, 18 Aug. 1959, 5400 feet (HEE) [MCZ]; 1 ♂, 12 mi. W Tucson, 8 May 1961, 3000 feet (RHP) [MCZ]. CALIFORNIA: 2 ♀♀, Tulare Co., Potwisha, 2000-5000 feet, June, July (E. C. Van Dyke) [CAS, USNM].

Variation. — In the male from Zacatecas, which I described in 1953, the parameres are nearly as long as the digiti and almost acute apically. In the more recently collected Morelos and Arizona males, the parameres are very much shorter and are abruptly, squarely truncate apically. In the females the color of the legs varies from wholly rufous to wholly black; in some specimens the apex of the abdomen is not notably compressed.

Allaporus rufiventris (Cresson)

Aporus rufiventris Cresson, 1872, Trans. Amer. Ent. Soc., 4: 207 [Type: ♀, TEXAS (G. W. Belfrage) (ANSP, No. 435)]. — Bequaert, 1919, Psyche, 26: 121.



Aporus minimus Cresson, 1872, *ibid.*, p. 207 [Type: ♂, TEXAS (G. W. Bel-
frage) (ANSP, no. 434)]. Synonym by Bradley, 1944.

Pompilus minimus Dalla Torre, *Cat. Hymen.*, 8: 302.

Pompilus rufiventricosus Dalla Torre, *ibid.*, p. 308 (n. name for *rufiventris*,
preoccupied in *Pompilus*).

Allaporus rufiventris Bradley, 1944, *Trans. Amer. Ent. Soc.*, 70: 120-121 (in
part).

Allaporus mexicanus Evans, 1950, *Ent. News*, 61: 3-4 [Type: ♀, MEXICO:
MORELOS: Cuernavaca, May 1945 (N.L.H. Krauss) (USNM, no.
59, 479)]. — Evans, 1951, *U. S. Dept. Agri., Monogr.* 2, p. 922. —
Evans, 1953, *Jour. Kansas Ent. Soc.*, 26: 29-30. New synonym.

When naming *mexicanus*, I accepted Bradley's statement that *rufiventris* was the same as Banks' *pulchellus*. An examination of Cresson's types shows that both *rufiventris* and *minimus* are the same species as *mexicanus*, leaving Banks' *pulchellus* as the earliest name for the widely distributed U. S. species which has usually been called *rufiventris*. Incidentally, the male I assigned to *mexicanus* in 1953 I am now quite sure was incorrectly placed; it is here reassigned to *fumipennis* new species. The males here assigned to this species are

characterized by unusually compact antennae and hyaline wings; they differ from males of *smithianus* only in minor details, as indicated in the key.

Female. — Length 6-9 mm. Head and thorax black, abdomen rufous, middle and hind legs black or more or less rufous; fore wing lightly infuscated, darker on apical fourth. Mandibles not specialized; vertex moderately sharp, less so than in *smithianus*; front relatively flat as compared to *pulchellus*. Clypeus nearly three times as broad as high. Propodeum elongate, sides of declivity with weak transverse rugae. Front femora slightly to moderately incrassate, measuring 2.6-3.2 X as long as thick. Wing venation as described for *smithianus*. Abdomen not notably compressed apically.

Male. — Length 3.6-5 mm. Black; wings almost clear hyaline, fore wing actually very weakly darkened on apical fourth; pubescence extensively silvery; erect setae almost totally absent. Mandibles unmodified; clypeus about 1.8 X as wide as high. Antennae very compact, segments 4-12 each 1.0-1.1 X as long as thick, entire antenna measuring less than twice TFD. Posterior ocelli separated from vertex crest by approximately their own diameters, the vertex crest slightly more rounded than in *smithianus*; head not concave behind. Longer spur of hind tibia nearly as long as basitarsus. Fore wing in all available specimens with the SMC2 fairly wide above; hind wing with first abscissa of cubitus long and strongly arched before junction with the intercubital vein, which is much less sloping than in *pulchellus*. SGP of moderate breadth, tapering to a narrowly rounded apex. Genitalia with the parameres club-shaped, abruptly truncate, much shorter than digiti, the latter covered with rather strong setae except on apical fifth.

Distribution. — This species ranges from Morelos and Michoacan to Texas and southeastern Arizona. (Map 14.)

Specimens examined. — 10 ♀♀, 7 ♂♂. MORELOS: 2 ♀♀, Cuernavaca, April, May (HEE, N. L. H. Krauss) [MCZ, USNM]; 1 ♀, 4 mi. E Cuernavaca, 29 June 1959, 6000 feet (HEE) [CU]; 1 ♀, 2 ♂♂, 3 mi. NW Cuernavaca, 7-17 June 1959, 6500 feet (HEE) [CU, MCZ]; 1 ♂, Canyon de Lobos, nr. Yautepec, 13 March 1959 (HEE) [CU]; 2 ♂♂, Las Estacas, 3000 feet, 6 April 1959 (HEE) [MCZ]; 1 ♀, Alpuyeca, 27 June 1951 (HEE) [MCZ]; 2 ♀♀, 3 mi. N Alpuyeca, 3400 feet, 30 March, 18 April 1959 (HEE) [MCZ, CU]. MICHOACAN: 1 ♂, Morelia, 11 Feb. 1954 (RRD) [MSU]. TEXAS: 1 ♀, Brownsville, 8 June 1937 (R. H. Crandall) [CU]; 1 ♀, 1 ♂ [? Bosque Co.] (Belfrage) [ANSP]. ARIZONA: 1 ♀, Cochise Co., 5 mi. W Portal, 5400 feet, 3 Aug. 1959 (HEE) [MCZ].

Allaporus pulchellus (Banks)

- Planiceps pulchella* Banks, 1910, Jour. N. Y. Ent. Soc., 18: 123 [Type: ♀, VIRGINIA: Falls Church, 21 July (NB) (MCZ, no. 13, 705)].
- Planiceps hesperus* Banks, 1929, Psyche, 36: 327 [Type: ♀, CALIFORNIA: Lone Mt., San Francisco, 4 July 1920 (FXW) (MCZ, no. 16, 235)].
- Allaporus pulchellus* Banks, 1933, Psyche, 40: 2.
- Allaporus hesperus* Banks, 1933, *ibid.*, p. 2.
- Allaporus rufiventris* Bradley, 1944, Trans. Amer. Ent. Soc., 70: 120-121 (in part). — Evans, 1950, Ent. News, 61: 1-4. — Evans, 1951, U. S. Dept. Agri. Monogr. 2, p. 922. — Krombein, 1952, Proc. Ent. Soc. Wash., 54: 177 (West Virginia). — Evans, 1953, Jour. Kansas Ent. Soc., 26: 26-27 (Mexican records). Misidentification.
- Euplaniceps aquilonaris* Dreisbach, 1952, Ent. News, 63: 95 [Type: ♂, CALIFORNIA: Santa Clara Co., Stanford Univ., 29 Sept. 1950 (P. H. Arnaud) (MCZ, no. 29, 313)].

Female. — Length 3.5-5.8 mm. Head and thorax black, abdomen rufous except black in some central California specimens; legs varying from wholly black to wholly rufous; scape and apical margin of clypeus occasionally rufous; wings subhyaline, fore wings distinctly darker on apical third. Pubescence extensively silvery or cinereous; erect setae very sparse and inconspicuous. Mandibles unspecialized; clypeus nearly 3 X as broad as high; front convex in profile, spatium frontale prominent; vertex not at all sharply margined. Propodeum without transverse rugae (except rugae weakly developed in occasional specimens). Front femora weakly incrassate, measuring 2.8-3.3 X as long as thick. Fore wing with SMC2 small and much narrowed above, but not usually triangular; outer discoidal cell higher than wide; hind wing with first abscissa of radial short, nearly vertical, first abscissa of cubitus relatively short, forming nearly a straight line with the strongly oblique intercubital vein (fig. 5). Abdomen usually not notably compressed apically.

Male. — Length 2.8-5.5 mm. Black, extensively covered with silvery pubescence, erect setae nearly absent; wings subhyaline, apical third of fore wing slightly infuscated in most specimens. Mandibles unmodified; clypeus approximately twice as broad as high. Antennae elongate for the genus, more than twice as long as TFD; segments 4-12 each 1.2-1.4 X as long as thick. Crest of vertex strongly rounded, not at all sharp. Longer spur of hind tibia .8-.9 the length of the basitarsus. Venation as in female. SGP of moderate breadth, tapering to a narrowly round apex (not differing significantly from that of *rufiventris*). Genitalia similar to those of *rufiventris*, but the parameres tending to be slightly less swollen and less strongly setose, the digits also with somewhat weaker setae.

Distribution. — Southern Mexico north to Oregon, Texas, and Pennsylvania. (Map 15.)



Mexican specimens examined. — 11 ♀♀, 38 ♂♂. CAMPECHE: 3 ♂♂, 10 mi. N Hopelchen, 17 Apr. 1962 (FDP) [UCD]. MORELOS: 1 ♀, 7 ♂♂, Cuernavaca, April-June 1959 (HEE) [MCZ, CU]; 1 ♂, 3 mi. NW Cuernavaca, 6500 feet, 27 May 1959 (HEE) [CU]; 1 ♂, Temixco, 30 Mch. 1962 (FDP) [UCD]; 10 ♂♂, 3 mi. N Alpuyecá, 3400 feet, April 1959 (HEE) [MCZ, CU]; 1 ♂, Lake Tequesquitengo, 2800 feet, 1 April 1959 (HEE) [CU]. MEXICO: 1 ♀, 5 ♂♂, Teotihuacan Pyramids, 7500 feet, April-July, 1951, 1959 (HEE, PDH) [CU, CIS, MCZ]. HIDALGO: 5 ♀♀, 3 ♂♂, Zimapan, 11-14 June 1951 (HEE, PDH) [MCZ, CIS]. PUEBLA: 1 ♀, Tehuacán, 23 June 1951 (HEE) [MCZ]; 1 ♀, 3 mi. NW Petlalcingo, 3 Apr. 1962 (FDP) [UCD]. MICHOACAN: 1 ♂, 5 km. W Zacapu, 13 July 1951 (HEE) [MCZ]. NAYARIT: 1 ♂, Ahuacatlán, 18 July 1951 (PDH) [CIS]. ZACATECAS: 2 ♀♀, 15 km. E Sombrerete, 28-31 July 1951 (PDH) [CIS]. SINALOA: 5 ♂♂, 8 mi. SE Elota, 19 May 1962 (FDP) [UCD].

Allaporus elegantulus Evans

Allaporus elegantulus Evans, 1953, Jour. Kansas Ent. Soc., 26: 27-29 [Type: ♀, DURANGO: El Salto, 3 August 1951 (PDH) (CAS)].

In this striking species the venation of the hind wing is about the same as in *pulchellus*, but other characters indicate that it stands close to *aurulentus*, from southeastern Arizona.

Female. — Length 7 mm. Color black; body clothed with coarse pubescence, for the most part silvery, but more brownish on the upper front and vertex, mesonotum, and broad preapical bands on the abdominal tergites. Fore wings twice-banded, with a dark band over the basal and transverse median veins, and a broader and darker apical band which does not quite attain the outer wing margin. Mandibles not specialized; clypeus 2.8 X as broad as high; vertex not elevated above eye tops nor sharply margined. Propodeum rather long, without rugosities. Venation as described for *rufiventris* except SMC2 triangular (at least in the one known specimen). Abdomen not compressed apically.

Distribution. — Known only from the type. (Map 13.)

Allaporus aurulentus new species

Holotype. — ♀, ARIZONA: Cochise Co., Southwestern Research Station, 5 mi. W Portal, 5400 feet, 18 Aug. 1959 (on ground beneath oak trees, HEE) [MCZ, no. 30, 961].

Description of type female. — Length 7.5 mm.; fore wing 5 mm. Head and thorax black; abdomen rufo-ferruginous except base of T1 black, T1-4 with apical dark bands, T5 blackish except at base, apical segment entirely black; mandibles and apical margin of clypeus rufous; scape rufous, remainder of antenna black; legs rufo-ferruginous except base of hind coxae infuscated and all tarsi blackish. Fore wing subhyaline, with a brown spot over the lower section of the basal vein and a broad brown band starting at the stigma and extending nearly to the wing tip, crossing the wing to the posterior margin; outer .1 of wing membrane subhyaline; hind wing nearly hyaline, apical fourth somewhat infuscated. Pubescence densely and conspicuously golden on sides of lower front, occiput, temples, and virtually the entire thorax and propodeum; upper front with dark brown pubescence; pubescence very fine and silvery on legs and on abdomen (except on the dark bands). Front with a few dark setae and coxae with some short, paler setae, but body otherwise virtually without erect setae except for the usual ones toward the apex of the abdomen. Mandibles slender, with two small teeth on the inner margin. Clypeus 2.8 X as broad as high, its apex truncate, its sides rounded. Head 1.07 X as wide as high; MID .67 X TFD, 1.10 X LID, 0.90 X HE; UID .80 X LID. POL: OOL=9:8; distance from hind ocelli to vertex crest about .7 X POL. First four antennal segments in a ratio of about 21:8:17:20, segment three 2.4 X as long as thick, .57 X UID. Crest of vertex not elevated above eye tops, not especially sharp; spatium frontale prominent, perpendicularly declivous be-

tween antennal sockets. Pronotal disc .85 X as long as wide, 1.4 X as long as mesoscutum. Propodeum relatively long, with a short, oblique declivity which is weakly transversely rugulose on the sides. Front femora not incrassate, measuring 3.2 X as long as wide; longer spur of hind tibia about half the length of the basitarsus. Fore wing with the basal vein arising basad of the transverse median vein, its lower section at first erect, then strongly arched; SMC2 1.3 X as wide as high, first and second intercubital veins meeting at the radius, so that this cell is triangular; outer discoidal cell about as wide as high. Hind wing with first abscissa of cubitus long and strongly arched before junction with intercubital vein, first abscissa of radius also arched before junction with this vein. Apex of abdomen not notably compressed.

Allotype. — ♂, ARIZONA: same data as type except 9 Aug. 1959 [MCZ].

Description of allotype male. — Length 5 mm.; fore wing 3.9 mm. Entirely black; pubescence silvery over most of body, more brownish on vertex, mesonotum, and apical bands on T1-4; last two tergites entirely brownish-pubescent. Erect setae very short, sparse, and inconspicuous. Fore wings subhyaline, with an indistinct spot on the basal vein and a broad, rather weak apical band which does not quite reach the outer wing margin. Mandibles unspecialized; clypeus 2.2 X as broad as high, its apical margin very weakly rounded. Head 1.05 X as wide as high; MID .67 X TFD, 1.25 X LID, subequal to HE; UID 1.12 X LID. POL:OOL=9:10; front angle of ocellar triangle about a right angle; hind ocelli slightly more than their own diameters from crest of vertex, which is moderately abrupt. First four antennal segments in a ratio of about 16:7:10:12, segment three about 1.3 X as long as thick, segment four 1.7 X as long as thick, following segments all considerably longer than thick. Pronotum with a small median notch on the posterior margin. Longer spur of hind tibia .95 X length of basitarsus. Venation as in female. SGP slightly more slender and tapering than in *rufiventris* and *pulchellus*, slightly less so than in *smithianus*. Genitalia not differing noticeably from those of *rufiventris*.

Paratypes. — ARIZONA: 2 ♀♀, 10 ♂♂, same data as type except dates varying from 3 to 19 Aug. 1959 [MCZ, CU, USNM, AMNH].

Variation. — The two female paratypes are both smaller than the type (fore wing 4.0 and 4.2 mm.); there are no differences in color of the integument, but in one specimen the pubescence of the thoracic dorsum and pleura is paler, more silvery than golden. The male paratypes show considerable size variation (fore wing 2.6 to 3.9 mm.). POL and OOL are subequal in one female and several of

the males. The second submarginal cell is triangular in all females, but in most of the males the first and second intercubital veins do not quite meet above. Most males have no indication of a spot over the basal vein.

Allaporus fascipennis Evans

Allaporus fascipennis Evans, 1959, Jour. Kansas Ent. Soc., 32: 29-30 [Type: ♀, TEXAS: Cameron Co., Shore of Laguna Madre, near Port Isabel, 10 May 1958 (HEE) (USNM, no. 64, 390)].

This striking form was described from a locality only a few miles from the Mexican border and may well be widely distributed in Mexico.

Female. — Length 8 mm. Head and thorax black, abdomen bright rufous except T1-4 each with a dusky posterior band; mandibles, apical part of clypeus, and first two antennal segments dusky ferruginous; legs mostly rufous. Fore wings with a brown blotch over the basal vein and the apical third of the wing brownish. Body clothed with rather coarse pubescence which is silvery over most of the body. Mandibles unspecialized; clypeus 1.8 X as wide as high, rather flat, its apex broadly truncate, its sides rather straight. Front rather flat, the spatium frontale but little elevated. POL:OOL = 9:7. Propodeum rather strongly transversely rugulose. Front femora not at all swollen. Fore wing with SMC2 slightly wider than high, sessile above; hind wing as in the preceding species. Apex of abdomen somewhat compressed.

Male. — Length 6 mm.; fore wing 4.5 mm. Black; wings completely hyaline; body with extensively silvery pubescence as in the preceding species; erect setae sparse, short, and inconspicuous. Clypeus flat, 1.8 X as wide as high; vertex elevated in an even arc above eye tops; POL:OOL = 8:5. Longer spur of hind tibia .83 X length of basitarsus. Venation as in female. SGP slender, much as in *smithianus* but less attenuate apically. Genitalia with the parameres nearly as long as the digiti, rather broadly rounded apically; digiti with sparse and rather long setae.

Distribution. — Known only from the type and allotype, collected at the same time and place in extreme southern Texas. (Map 13.)

Genus EUPLANICEPS Haupt

Euplaniceps Haupt, 1930, Mitt. Zool. Mus. Berlin, 16: 724, 751 [Type species: *Pedinaspis variipennis* Perty, original designation]. — Bradley, 1944, Trans. Amer. Ent. Soc., 70: 124-136 (revision). — Banks, 1947, Bull. Mus. Comp. Zool., 99: 447-449.

Generic characters. — Female. Length 7.5-16 mm. Black, all known species with T2, 3, and 6 spotted or banded with whitish, orange, or reddish, tibial spurs also in large part pale; wings strongly banded. Mandibles with a single tooth on the inner margin, with or without a small tooth on the lower margin. Clypeus rather flat, more or less truncate apically, nearly reaching the lower inner eye margins. Malar space absent. Lower half of front with a pair of grooves for the reception of the scape; these grooves extend upward, nearly parallel to the inner eye margins, leaving between them a more elevated median strip which may be on the same plane as the clypeo-frontal bridge and the clypeus, or which may be more elevated and strongly declivous between the antennal sockets. Antennal sockets well above bottoms of eyes; eyes glabrous. Pronotum very long; propodeum rather long, flat in front and with an oblique declivity behind. Front femora incrassate. Claws dentate or bifid. Fore wing with two SMCs, the second receiving both recurrent veins; hind wings with the anal and transverse median veins confluent, forming an even arc which meets the median vein a considerable distance basad of the origin of the cubitus (fig. 6).

Male. Length 6-9 mm. Black, the spurs whitish and the hind tibiae with a white streak; tergites with or without whitish spots as in the female; wings usually banded. Mandibles with a single tooth on the inner margin. Antennae of variable length, often somewhat crenulate in profile. Pronotum short; propodeum relatively long, the slope low and even. Front claws bifid, the inner claw of each pair strongly curved; middle and hind claws dentate or bifid. Venation as in female. Abdomen compressed apically. SGP of simple structure, somewhat tectiform. Genitalia very similar to those of *Allaporus*; parameres short, more or less truncate apically; digiti simple, bearing short, simple setae; basal hooklets single; parapenial lobes strong, compressed; aedoeagus small, as in all Aporini.

Distribution. — Throughout South America except the extreme southern part; one species occurs in Panama.

Included species. — This is a fairly large genus, but all of the species except the Chilean *saussurei* Kohl are rare in collections. Bradley had seen the types of but few of the species when he prepared his revision. Banks (1947) described two additional species, both from males, and Banks' *Sericopompilus exilis* represents another male of this genus (new combination; probably it is the male of *herbertii* Fox). I have seen several undescribed South American species. A new revision of this group is much needed.

Remarks. — This is a very distinctive genus, perhaps not closely related to *Aporus*. Bradley has erected the subgenus *Pholidaporus* to accommodate *perpicta* (Fox), from Brazil, which has the claws bifid.

Euplaniceps ceres (Cameron) new combination

Pompilus ceres Cameron, 1897, Ann. Mag. Nat. Hist., (6)19: 374 [Type: ♀, PANAMA (Boucard) (no further data) (BMNH, no. 19, 762)]. — Cameron, 1899, Biol. Centr. Amer., Hymen. II, Suppl., p. 404.

This species was overlooked by Bradley (1944). Apparently it has not been taken since the type was collected many years ago. It will run to *varia* Bradley (from Peru) in Bradley's key, but the apical tergite has a white spot rather than being orange as in that species, and the pronotum and front coxae have dense black setae not present in that species.

Description of type female. — Length 16 mm.; fore wing 11 mm. Color black, except T2-4 each with a pair of large whitish spots, apical tergite with a similar spot; spurs whitish. Fore wings prominently banded, brownish at base and also along costal and submedian and anal cells, leaving a large part of the median cell whitish; a broad brown band across basal and transverse median veins and another across marginal cell to posterior wing margin, the narrow band between them whitish; apex of wing subhyaline. Pubescence dark, except silvery, with a somewhat golden luster, as follows: sides of lower front, basal parts of legs, mesopleura, posterior half of mesoscutum, scutellum, sides of metanotum and postnotum, and postero-lateral angles of propodeum; pubescence on central part of thoracic dorsum, especially the scutellum, coarse and very conspicuous. Front, pronotum, and front coxae with dense black setae; front femora and tibiae with numerous black setae, even the tarsi somewhat setose, but middle and hind legs hardly at all setose, except coxae weakly so; mesoscutum and scutellum sparsely hairy, propodeum bare. Abdominal venter and apical two tergites somewhat setose. Clypeus 2.7 X as broad as high, its apical margin truncate. Head 1.12 X as broad as high; MID .60 X TFD, 1.25 X LID, 0.8 X HE; UID 1.15 X LID. POL:OOL=18:17; ocelli in a broad triangle, front angle greater than a right angle. First four antennal segments in a ratio of about 33:8:26:24, segment three 3 X as long as thick, .42 X UID. Vertex weakly arched between tops of eyes; area within and behind ocellar triangle weakly humped. Lower two-thirds of front with a median linear elevation, almost carinate, this area much raised above sides of front, forming a nasale which is abruptly declivous just below antennal sockets. Pronotum elongate, disc .95 X as long as its maximum width, 1.3 X as long as mesoscutum. Propodeum elongate, sloping but weakly in front, abruptly, obliquely declivous behind. Legs strongly spinose; longer spur of hind tibia .4 as long as hind basitarsus; claws with a strong tooth. Fore wing with marginal cell removed from wing tip by about its own length; SMC2 twice as wide as high.

Distribution. — Panama; known only from the type.

Genus **PSORTHASPIS** Banks

- Psorthaspis* Banks, 1912, Jour. N. Y. Ent. Soc., 19: 231 [Type species: *Ferreola laevifrons* Cresson, original designation (proposed as subgenus of *Pedinaspis*)]. — Banks, 1919, Bull. Mus. Comp. Zool., 63: 230, 241 (full genus). — Bradley, 1944, Trans. Amer. Ent. Soc., 70: 32-79 (revision). — Evans, 1954, Amer. Mus. Novitates, no. 1662, 18 pp. (spp. of Mexican plateau).
- Idopedinaspis* Haupt, 1930, Mitt. Zool. Mus. Berlin, 16: 724, 783 [Type species: *Ferreola laevifrons* Cresson, designated by Haupt, 1937]. — Haupt, 1937, Boll. Ist. Ent. Bologna, 9: 75. Synonymy by Bradley, 1944.
- Idiopedinaspis* Neave, 1939, Nomen. Zool., 2: 762 (typographical error).
- Dicyrtomalis* Bradley, 1944, Notulae Nat., Acad. Nat. Sci. Phila., no. 145, p. 11 [Type species: *Pompilus connexus* Cresson, original designation].
New synonym.

Generic characters. — Female. Length 8-24 mm. Color black, some species patterned with whitish, orange, or reddish; wings fuscous or banded with fuscous. Mandibles with a single tooth on the inner margin; lower margin with a rounded lamina which is set off by a fimbriate groove. Clypeus relatively flat, not as wide as LID. Face below and between antennal sockets somewhat ridged to form a weak to strong clypeo-frontal bridge. Malar space absent or very short; eyes with only minute setae. Ocelli situated at some distance from vertex crest, which is often rather sharp. Pronotum longer than mesoscutum, its surface depressed only slightly to level of collar, the collar articulating with the head very high, not far from the vertex crest. Front femora not incrassate. Apical tarsal segments not spined beneath, or with a few lateral spines. Claws with the tooth acute, sometimes very strong and subparallel to outer ray. Fore wing with three SMCs, the second and third each receiving a recurrent vein near the middle, the third fairly wide above; hind wing with the transverse median vein not differentiated from the anal vein, which arches up to join the median vein a short distance before the origin of the cubitus; anal lobe not much over half the length of the submedian cell (fig. 7).

Male. Length 6-17 mm. Color black, often variegated by pubescence of various colors; wings hyaline or more or less fuscous. Mandibles about as in female, also the eyes and malar space. Antennae of variable length, in some species very short, the third segment in any case much shorter than the fourth and not more than 1.5 X as long as thick. Clypeus not as wide as LID, flat or weakly convex. Crest of vertex relatively abrupt, most species with the ocelli at some distance in front of the vertex crest. Pronotum moderately long; postnotum short, transversely linear. Claws dentate or bifid. Venation as in female. Abdomen somewhat compressed. Genitalia with the parameres very short, more or less truncate apically; basal hooklets single;

parapenial lobes strong, compressed, and aedoeagus small and simple, as in *Aporus* and related genera (figs. 28-30).

Distribution. — The genus is confined to the New World and ranges from Colombia north to the southern half of the United States, also throughout the Greater Antilles.⁶

Included species. — Thirteen species inhabit Mexico and Central America and are treated below. Nine others inhabit southern United States, but do not enter Mexico so far as known, one occurs in Colombia, and five occur in the Greater Antilles.

Remarks. — The distribution of members of this genus suggests that the group may have evolved in southern North America during the period when there was no land connection with South America. One species, *planata*, is known to attack trap-door spiders (Ctenizidae), and the structure of the head and prothorax suggests that all species attack ctenizids or at least some type of burrowing spider. Some of the resemblances to *Aporus* may be the result of convergence, as some members of this genus also attack trap-door spiders. On the other hand, the male genitalia of *Psorthaspis* are much like those of *Aporus*, and the two genera may be genuinely related, perhaps both having evolved from an early *Epipompilus*-like ancestor.

The following key does not include the nine species occurring in southern United States, even though some of these will surely be found to enter northern Mexico. The keys of Bradley (1944) and of Evans (1954) cover the U. S. species adequately. Considerable revision of the Central American species has been undertaken in the present paper.

Key to Species

Females

1. Clypeo-frontal bridge variable, but never as below, if somewhat flat-topped the flat portion between the antennal sockets not more than half as wide as one of the sockets and the hind tibiae without spines above .. 2
Clypeo-frontal bridge wide, flat-topped, the flat top between the antennal

⁶ Smith described a *Ferreola unicolor* from Peru in 1855, and Bradley assigned this species to *Psorthaspis*, although he had not seen it. I recently examined the type of this species in the British Museum. It appears to be a true *Ferreola* and is unlike anything I have seen from this hemisphere. Undoubtedly this specimen is mislabeled and is from some part of the Old World tropics.

- sockets about as wide as one of the sockets; hind tibia with several strong spines above 13
2. Claws dentate, the outer ray not curved in such a way as to be sub-parallel to the tooth, which is short; all black species 3
- Claws sub-bifid, the outer ray curved so that it is nearly parallel to the tooth, which is strong; black or variously colored 7
3. Clypeus about twice as wide as high, almost as wide as LID; vertex extended only slightly above eye tops; clypeo-frontal bridge weakly developed, considerably below level of clypeus and front *vicina* (Cresson)
- Clypeus about 1.5 X as wide as high, not nearly as wide as LID; vertex extending considerably above eye tops; hind tibiae without spines above (*macronotum*) 4
4. Head very broad, TFD considerably exceeding VFD; body and wings clothed with bright bluish pubescence *macronotum macronotum* (Kohl)
- Head at least as high as wide 5
5. Propodeum without transverse rugae or almost so; clypeus almost rectangular, the sides nearly parallel; vertex extended far above eye tops *macronotum cressoni* Bradley
- Propodeum with well-developed transverse rugae, at least laterally; clypeus with its sides converging somewhat to the subtruncate apex 6
6. Clypeo-frontal bridge fairly wide, its flat upper surface about half the width of an antennal socket *macronotum zacateca* Evans
- Clypeo-frontal bridge narrow, round-topped *macronotum hurdi* Evans
7. Body entirely black, pubescence more or less bluish or violaceous; wings fuscous, violaceous (*laevifrons* group) 8
- Abdomen with whitish to orange spots or bands; pubescence extensively silvery, yellowish, and/or orange; wings strongly banded (*variegata* group) 16
8. Clypeo-frontal bridge very small, in lateral view seen to be on a somewhat lower plane than the area frontalis; front narrow for the genus; vertex not extending much above eye tops *laevifrons* (Cresson)
- Clypeo-frontal bridge on the same plane as the area frontalis 9
9. Apical margin of clypeus truncate or weakly emarginate 10
- Apical margin of clypeus evenly convex 12
10. Vertex strongly produced, weakly concave in anterior view, distance from posterior ocelli to vertex crest about 1.6 X POL; abdomen strongly compressed *regalis* (Smith)
- Vertex less produced, not concave in anterior view; distance from posterior ocelli to vertex crest not more than about 1.3 X POL; abdomen weakly compressed 11
11. Ultimate segments of middle and hind tarsi with a few lateral spines beneath; posterior ocelli removed from vertex crest by about 1.25 X POL; size large (24 mm.) *coelestis* Bradley

- Ultimate tarsal segments not spined beneath except at apex; posterior ocelli removed from vertex crest by slightly less than POL; smaller (14 mm.) *guatemalae* Bradley
12. Front less broad than below, MID .64 X TFD, .95 X eye height; posterior ocelli removed from vertex crest by about 1.1 X POL *eubule* (Cameron)
- Front very broad, MID about .7 X TFD, 1.15 X eye height; posterior ocelli removed from vertex crest by 1.3-1.5 X POL *bradleyi* Evans
13. Pubescence very fine, over most or all of the body bluish, blue-green, or violaceous; wings fuscous, violaceous *planata* (Fox)
- Pubescence of pronotum, mesoscutum, and some of abdominal segments orange, very dense, concealing the integument; tips of fore wings often somewhat pale 14
14. Wings banded; apical two tergites with dark pubescence; propodeum and T1 with whitish pubescence *formosa* (Smith)
- Wings not banded, merely paler at tip of fore wing; apical two segments with orange pubescence like the preceding segments; pubescence of propodeum and T1 wholly dark (*portiae*) 15
15. Pronotum with orange pubescence extending well down on side-pieces
- *portiae portiae* (Rohwer)
- Pronotum with orange pubescence extending onto the side-pieces only slightly if at all, this pubescence tending to be less coarse than above *portiae conocephala* Bradley
16. Dorsal surface of pronotum continuous with collar; collar inserted close to top of head; vertex not elevated behind ocelli; T3 with pale markings, mesoscutum with orange pubescence 17
- Disc and collar of pronotum separated by a short, vertical surface; crest of vertex somewhat elevated medially, separated from insertion of prothorax by a short, vertical surface; T2 and 4 with pale markings, 3 black; mesoscutum with dark pubescence 18
17. Tergite 3 with an orange band, emarginate behind; anterior half of pronotum with dark pubescence *variegata variegata* (Smith)
- Tergite 3 with two large whitish spots; pronotum wholly covered with yellowish to orange pubescence *variegata impudica* (Cameron)
18. Markings of T2, 4, and 5 yellow to orange; pronotum wholly covered with yellowish to orange pubescence *connexa connexa* (Cresson)
- Markings of T2 and 4 ivory white, tergite 5 black; posterior lateral parts of pronotum with dark pubescence *connexa bugabensis* (Cameron)

Males [†]

1. Wings wholly infuscated; pubescence predominantly or wholly dark 2
- Wings hyaline, at least in considerable part; pubescence in considerable part or wholly pale 12

[†] The males of *coelestis* and of *variegata impudica* are unknown.

2. Claws of middle and hind tarsi dentate, the tooth erect or sloping outward slightly, not close to or subparallel to outer ray; SGP strongly dentate laterally (fig. 64) 3
All claws bifid, i.e., the tooth is close to the outer ray and subparallel to it; SGP at most weakly angulate on the sides (figs. 67-70) 7
3. Inner claws of front tarsi much more strongly curved than outer claws of front tarsi, deeply bifid; propodeum not or barely hairy *vicina* (Cresson)
Inner claws of front tarsi only very slightly more curved than outer claws, less deeply bifid than above; propodeum moderately to strongly hairy (*macronotum*) 4
4. Head distinctly wider than high, TFD greater than VFD; head rather thin *macronotum macronotum* (Kohl)
Head not wider than high, VFD at least as great as TFD 5
5. Erect hair of body much reduced, femora and middle and hind coxae barely or not at all hairy; vertex, in anterior view, often nearly straight in the center, descending abruptly on the sides *macronotum cressoni* Bradley
Coxae and femora rather strongly hairy; vertex forming a nearly smooth arc from side to side 6
6. Antennae elongate, segments 4-12 each generally at least 1.5 X as long as wide; body densely hairy, including the femora and even to some extent the tibiae *macronotum zacateca* Evans
Antennae shorter, segments 4-12 only about 1.4 X as long as thick, the segments slightly imbricate; femora moderately hairy, the tibiae not or barely hairy *macronotum hurdi* Evans
7. Vertex moderately to strongly humped behind the ocellar triangle; SGP with lateral angulations beyond which it tapers to a subacute apex (about as in fig. 65) *planata* (Fox)
Vertex not or very weakly elevated medially, usually forming a more or less even arc; SGP not angulate laterally, or if so much more blunt apically 8
8. Vertex, as seen in full frontal view, forming a low arc, not extending much if at all above the hind ocelli; propodeum sloping rather evenly from front to rear, only slightly steepened behind; pubescence wholly dark, even on the front 9
Vertex somewhat produced, when seen in full frontal view arched well above the hind ocelli; propodeum rather long, sloping but weakly except abruptly declivous behind 10
9. Antennae short, segments 4-12 each 1.2-1.4 X as long as wide; SGP unusually slender (fig. 67) *guatemalae* Bradley
Antennae slightly longer, segments 4-12 each 1.4-1.6 X as long as wide; SGP relatively broad and short (fig. 69) *eubule* (Cameron)
10. Not strongly hairy, the middle and hind coxae and femora with only scattered, short hairs; SGP subangulate laterally, quite blunt apically (fig. 70); front with silvery pubescence *laevifrons* (Cresson)

- Strongly hairy species, all the coxae and femora rather densely hairy; SGP more elongate, not subangulate laterally (fig. 68) 11
11. Pubescence rich bluish, except somewhat silvery on the lower front; abdominal dorsum with only sparse, short setae, the femora with fairly short hair *regalis* (Smith)
 Pubescence largely violaceous or purplish, nowhere silvery; body and legs unusually strongly hairy, even the abdominal dorsum, the femora with rather long hair *bradleyi* Evans
12. Antennae moderately long, segment four 1.2-1.7 X as long as thick; fore wing without a brownish cloud at basal vein; SGP with lateral angulations 13
 Antennae very short, segment four barely if at all longer than thick; wings somewhat banded, fore wing with at least a weak dark band at basal vein 15
13. Vertex not or but slightly elevated behind the ocellar triangle; wings weakly tinged with brownish, more especially so in the marginal cell and along the outer wing margin *formosa* (Smith)
 Vertex strongly humped behind the ocellar triangle; wings usually clear hyaline, occasionally with a weak band along the outer margin of the fore wing (*portiae*) 14
14. Head and thorax, including coxae and femora, with rather abundant short, white hairs; body more or less patterned with silvery and darker pubescence, the silvery pubescence of the T1 and 2 often more or less divided down the midline *portiae portiae* (Rohwer)
 Head and thorax much less hairy, the femora and middle and hind coxae without hairs; body wholly covered with silvery pubescence, the dark pubescence usually confined to posterior margins of T1 and 2
 *portiae conocephala* Bradley
15. Body patterned with rather coarse silvery and darker pubescence; vertex not as sharp as below, nor propodeum as strongly produced backward; antennal segments 4-12 each about as long as wide, or slightly longer *variegata variegata* (Smith)
 Body pubescence very fine, varying from silvery to brownish but not forming a strong pattern; vertex crest rather sharp, the head slightly concave behind; postero-lateral angles of propodeum projecting backward as strong vertical flanges; antennal segments 4-12 each somewhat wider than long (*connexa*) 16
16. Pubescence in large part dark, conspicuously silvery only on head, lower pleura, propodeum, legs, and abdomen *connexa connexa* (Cresson)
 Pubescence silvery over most of body *connexa bugabensis* (Cameron)

Psorthaspis vicina (Cresson)

Parapompilus vicinus Cresson, 1872, Trans. Amer. Ent. Soc., 4: 206 [Lectotype: ♀, TEXAS (G. W. Belfrage) (ANSP, no. 440)].

Pompilus bombinator Dalla Torre, 1897, Catal. Hymen., 8: 277.

Pompilus (Pedinaspis) vicinus Fox, 1897, Ent. News, 8: 33.

Pedinaspis (Pedinaspis) vicinus Banks, 1912, Jour. N. Y. Ent. Soc., 19: 231.

Psorthaspis vicina Bradley, 1944, Trans. Amer. Ent. Soc., 70: 61-63.

This is undoubtedly the most primitive member of the genus, as evidenced by the weakly developed clypeo-frontal bridge and transverse, slightly convex clypeus.

Female. — Length 11-16 mm. Black, rendered dark bluish and/or violaceous by the pubescence; wings fuscous, weakly reflecting bluish or coppery. Erect hairs short and inconspicuous on front, thoracic dorsum, and front coxae, largely absent elsewhere. Clypeus about twice as wide as long, almost as wide as LID; apical margin evenly rounded. Clypeo-frontal bridge very weak, much depressed below level of clypeus and front. Inner eye margins subparallel, UID barely if at all greater than LID; vertex passing straight across a short distance above tops of eyes. Posterior ocelli removed from vertex crest by a distance slightly greater than POL. Propodeum smooth or with some weak striae on the sides of the declivity. Claws not strongly curved, the tooth erect and widely separated from the apical ray. Abdomen but weakly compressed.

Male. — Length 8-10 mm. Color of body and wings as in female. Head, thoracic dorsum, propleura, and front coxae with some short, erect hairs, body and legs otherwise without erect hairs. Head subcircular in anterior view, about as wide as high, vertex forming an even arc above eye tops. Clypeus 1.8 X as wide as high, its apical margin rounded. Antennal segment four about 1.9 X as long as thick. Propodeum with a strongly defined, concave declivity behind. Claws dentate except inner claws of front tarsi strongly curved, deeply bifid, the inner ray lobe-like, outer claws of front tarsus subbifid. SGP with strong lateral angulations (fig. 64).

Distribution. — Known only from Texas and Tamaulipas. (Map 16.)

Specimens examined. — 21 ♀♀, 5 ♂♂. TEXAS: 9 ♀♀, 5 ♂♂ (? Bosque Co.) (Belfrage) [ANSP, USNM, CU]; 1 ♀, College Station, 17 May 1936 [MCZ]; 2 ♀♀, Bastrop St. Pk., Bastrop Co., 19 June 1956 (HEE) [MCZ]; 1 ♀, Williamson Co., 5 Oct. 1935 (J. E. Gillaspay) [Gillaspay Coll.]; 4 ♀♀, Fedor, Lee Co., May, June (G. Birkman) [MCZ]; 1 ♀, Riviera Beach, Kleburg Co., 18 June 1948 (HEE) [MCZ]; 2 ♀♀, Port Isabel, Cameron Co., 20, 23 June 1948, 1956 (HEE) [MCZ]. TAMAULIPAS: 1 ♀, Tampico, 28 March 1951 [KU].



***Psorthaspis macronotum macronotum* (Kohl)**

Pompilus macronotum Kohl, 1886, Verh. K.K. Zool.-Bot. Ges. Wien, 36: 336.

[Type: ♀, MEXICO: MORELOS: Cuernavaca (Vienna Mus.)]. —
Cameron, 1893, Biol. Centr.-Amer., Hymen. II, p. 187.

Pedinaspis macronotum Schulz, 1911, Zool. Ann., 4: 119.

Psorthaspis macronotum Bradley, 1944, Trans. Amer. Ent. Soc., 70: 44-45.

Psorthaspis macronotum macronotum Evans, 1954, Amer. Mus. Novitates, no. 1662, pp. 6-7 (Morelos, Jalisco).

This appears to be a relatively common wasp in parts of Central Mexico. I have not seen the type, but am reasonably confident that Kohl's name is being employed correctly. This species and its various subspecies are best recognized by the complete absence of spines on the upper side of the hind tibiae of the female and by the fact that the male subgenital plate is very strongly angularly produced on the sides.

Female. — Length 12-21 mm. Black, body, legs, and fore wings rendered a brilliant dark blue by the pubescence; erect setae short and inconspicuous, distributed as in *vicina*. Head considerably broader than high, TFD 1.02-1.06 X VFD; UID about 1.15 X LID. Clypeus about 1.5 X as wide as high, its apical margin weakly rounded. Clypeo-frontal bridge round-topped, not at all

depressed below level of clypeus or front. POL:OOL = 3:4; distance from hind ocelli to vertex crest equal to about 1.3 X POL. Propodeum with moderately strong rugae on sides of declivity. Front basitarsus with a few spines on its outer side, forming a weak comb; hind tibia without spines above and with only a few below. Claws not strongly curved, the tooth erect. Wings as in figure 7.

Male. — Length 7-14 mm. Color as in female, but body with much more erect hair, the propodeum and coxae being strongly hairy, the abdominal dorsum even slightly hairy. Head rather thin and wide, TFD about 1.1 X VFD. Clypeus about 1.6 X as wide as high, rounded apically. Antennae elongate, segment three 1.0-1.3 X as long as broad, segments 4-11 each 1.4-2.0 X as long as broad. Eyes strongly divergent above, UID about 1.2-1.25 X LID; ocelli in a flat triangle, OOL much exceeding POL. Front claws bifid, the inner claw of each pair barely more curved than the outer claw, but with the tooth more blunt; middle and hind claws dentate, but with the tooth sloping outward somewhat. SGP strongly angulate on each side, the apex acutely angulate. Genitalia with the parameres squarely truncate apically, the digits narrowly rounded and somewhat deflected mesad at apex.

Distribution. — Central Mexico, Oaxaca to Jalisco. (Map 17.)

Specimens examined. — 62 ♀♀, 61 ♂♂. OAXACA: 1 ♀, Huajuapán, 5100 feet, 25 June 1963 (HAS) [OSU]. PUEBLA: 1 ♀, 3 mi. NW Petlalcingo, 22 Aug. 1959 (LS & AM) [UCD]. MORELOS: 11 ♀♀, Alpuyeca, 27 June 1951 (HEE, PDH) [MCZ, CU, USNM, AMNH, CIS]; 34 ♀♀, 56 ♂♂, 2 mi. S Alpuyeca, 14-28 May 1959, 3000 feet (HEE) [MCZ, CU, USNM, CAS, ENAC, ANSP]; 13 ♀♀, 4 ♂♂, 3 mi. N Alpuyeca, Mch., Apr. 1959, 3400 feet (HEE) [MCZ, CU]; 1 ♀, Cuernavaca, 6 June 1957 (CY) [MCZ]; 1 ♀, Tepoztlán, 15 Nov. 1956 (CY) [MCZ]. JALISCO: 1 ♂, Guadalajara, 23 July 1951 (HEE) [MCZ].

Psorthaspis macronotum zacateca Evans

Psorthaspis macronotum zacateca Evans, 1954, Amer. Mus. Novitates, no. 1662, pp. 8-10 [Type: ♀, MEXICO: ZACATECAS: 15 km. E. Somrerete, about 7300 feet, 28-31 July 1951 (HEE) (AMNH)].

This is apparently a rather common wasp in north central Mexico east of the Sierra Madre Occidentale.

Female. — Length 14-21 mm. Black, body pubescence dark violaceous (contrasting to the blue of *m. macronotum*); wings fuscous, violaceous. Head about as wide as high; MID about .70 X TFD; UID about 1.15 X LID. Posterior ocelli removed from vertex crest by about 1.4 X POL. Clypeo-frontal

bridge not at all depressed, rather wide, its flattened top at the narrowest point approximately half the width of an antennal socket. Other features as in the nominate subspecies.

Male. — Length 8-19 mm. Coloration as in female; body rather densely hairy, the coxae and femora with abundant short hairs, the hairs on the femora denser and longer than in *m. macronotum*.

Distribution. — San Luis Potosi, Zacatecas, Durango, and the southern half of Chihuahua, Mexico. (Map 17.)

Specimens examined. — 21 ♀♀, 82 ♂♂. SAN LUIS POTOSI: 1 ♀, 1 ♂, 18 mi. SW San Luis Potosi, 7300 feet, 2 Oct. 1957 (HAS) [OSU]. ZACATECAS: 3 ♀♀, 62 ♂♂, 15 km. E Sombrerete, 7300 feet, 28-31 July 1951 (HEE, PDH) [AMNH, CIS, CU, USNM, MCZ]. DURANGO: 11 ♀♀, 3 ♂♂, Nombre de Dios, July, Aug. (HEE, PDH, EIS) [MCZ, CU, CIS]; 1 ♂, 10 km. N Nombre de Dios, 5 Aug. 1951 (HEE) [MCZ]; 2 ♂♂, San Juan del Rio, 7 Aug. 1951 (PDH) [CIS]; 1 ♀, Pedricena, 4500 feet, 19 Aug. 1947 (CDM) [AMNH]; 2 ♀♀, 10 mi. W Durango, 12 July 1954 (EIS) [CIS]; 1 ♂, 23 mi. NE Durango, 6300 feet, 17 June 1956 (HAS) [OSU]; 2 ♀♀, 8 mi. S Canutillo, 9 Aug. 1951 (HEE, PDH) [MCZ, CIS]; 8 ♂♂, 14 mi. NW Ceballos, 10 Sept. 1963 (HAS) [OSU]. CHIHUAHUA: 1 ♀, 8 mi. S Camargo, 10 Aug. 1951 (PDH) [CIS]; 1 ♂, 16 mi. SE Chihuahua, 11 July 1947 (R. Schramel) [AMNH]; 3 ♂♂, 66 mi. S Hidalgo del Parral, 20 June 1956 (HAS) [OSU, MCZ].

Psorthaspis macronotum hurdi Evans

Psorthaspis macronotum hurdi Evans, 1954, Amer. Mus. Novitates, no. 1662, pp. 7-8 [Type: ♀, MEXICO: JALISCO: Villa Guadalupe, about 25 km. N Tepatitlán, 26 July 1951 (PDH) (AMNH)].

This subspecies is very similar to *m. arizonensis* Dreisbach, from southern Arizona. Presumably the range of these two subspecies will be found to meet in Sonora or Sinaloa.

Female. — Length 14-18 mm. Black, pubescence bluish, with some greenish reflections, sometimes in part violaceous; wings violaceous. Head about as wide as high; MID about .70 X TFD; UID about 1.15 X LID. Posterior ocelli removed from vertex crest by about 1.3-1.4 X POL. Clypeo-frontal bridge very narrow, reduced to a mere ridge at the level of the bottoms of the antennal sockets, in profile depressed only very slightly below level of clypeus

and front. Antennae rather short, segment 3 and 4 together equal to .50-.58 X UID. Propodeum rugulose, as in the preceding two subspecies.

Male. — Length 10.5 mm. Black, pubescence bluish, on the dorsum somewhat violaceous; wings fuscous, violaceous. Body densely hairy as in the preceding two subspecies, but the tibiae not or barely hairy. Head in anterior view subcircular, about as wide as high. Antennae rather short, segment three 1.2 X as long as thick, segments 4-12 each about 1.4 X as long as thick. Other features as in *m. macronotum*.

Distribution. — This subspecies is presently known only from Sinaloa, Jalisco, and the state of Mexico. The range contacts that of *m. macronotum* at Guadalajara, but no intergrades are represented in the limited material available. (Map 17.)

Specimens examined. — 7 ♀♀, 2 ♂♂. SINALOA: 1 ♀, Camino Real de Piaxtla, 200 feet, 3 May 1949 (G. M. Bradt) [AMNH]. JALISCO: 3 ♀♀, 1 ♂, Villa Guadalupe, same data as type [AMNH, CIS]; 1 ♀, 8 mi. S Guadalajara, late Sept. 1954 (FXW) [CAS]; 1 ♀, Ojuelos de Jalisco, 7400 feet, 21 Aug. 1954 (CDM) [KU]; 1 ♀, 27 mi. NE Lagos de Moreno, 7300 feet, 21 Aug. 1954 (CDM) [KU]. MEXICO: 1 ♂, 34 km. W Toluca, 8500 feet, 9 Aug. 1962 (HEE) [MCZ].



Psorthaspis macronotum cressoni Bradley

Parapompilus laevifrons Cresson, 1872, Trans. Amer. Ent. Soc., 4: 206 (*nec Ferreola laevifrons* Cresson 1869; misidentification).

Pedinaspis (Psorthaspis) laevifrons Banks, 1912, Jour. N. Y. Ent. Soc., 19: 231 (misidentification).

Psorthaspis cressoni Bradley, 1944, Trans. Amer. Ent. Soc., 70: 59-60 [Type: ♀, TEXAS (G. W. Belfrage) (ANSP)].

Psorthaspis levis Bradley, 1944, *ibid.*, p. 43 [Type: ♂, TEXAS: San Diego, Duval Co., 30 April (USNM, no. 57, 924)]. Synonym by Evans, 1954.

Psorthaspis nahuatlensis Bradley, 1944, *ibid.*, p. 46 [Type: ♂, MEXICO: VERA-CRUZ: Medellin, Fall 1895 (H. Heyde) (USNM, no. 57, 926)]. — Evans, 1954, Amer. Mus. Novitates, no. 1662, pp. 6, 15. New synonym.

Psorthaspis macronotum cressoni Evans, 1954, Amer. Mus. Novitates, no. 1662, p. 11 (Nuevo Leon).

In this form the vertex is rather strongly elevated above the eye tops and the propodeum of the female is without rugae or almost so. The male is much less hairy than in the preceding three subspecies, but the characters of the terminalia employed by Bradley for *levis*, *nahuatlensis*, and for the male *cressoni* do not seem to me reliable.

Female. — Length 12-24 mm. Black, pubescence reflecting dark bluish and/or violaceous; wings fuscous, violaceous. Head higher than wide, TFD about .90 X VFD; vertex strongly produced above eye tops (more strongly in larger specimens), distance from posterior ocelli to vertex crest from 1.6 to 2.1 X POL. Clypeus more nearly quadrangular than in other subspecies, its sides straight and subparallel, its apical margin weakly convex. Clypeo-frontal bridge round-topped, essentially similar to that of *m. macronotum*. Pronotum slightly longer than in other subspecies, disc about .75 X as long as its maximum width. Propodeum smooth in most specimens, with a few weak rugae in some.

Male. — Length 8-14 mm. Color as in female; body with much less hair than in the preceding three subspecies, the propodeum with sparse, short hair, the legs not or barely hairy except for the front coxae. Clypeus rounded or subtruncate apically. Head very slightly higher than wide; vertex broadly rounded, in general extended farther above eye tops than in other subspecies, but rather variable in this regard. Antennae of moderate length, segments 4-12 each 1.3-1.5 X as long as wide. Other features essentially as in *m. macronotum*.

Distribution. — Texas and northeastern Mexico, south to Veracruz. (Map 17.)

Specimens examined. — 22 ♀♀, 40 ♂♂. TEXAS: 9 ♀♀, 7 ♂♂, (? Bosque Co.) (Belfrage) [ANSP, USNM, CU]; 1 ♀, Lee Co. (Birkman) [MCZ]; 1 ♂, Llano, 25 Oct. 1905 (A. W. Morrill) [USNM]; 1 ♀, Austin, Oct. 1899 (C. T. Brues) [MCZ]; 1 ♀, Mercedes, Jan. 1909 [USNM]; 1 ♀, Kingsville (C. T. Reed) [MCZ]; 1 ♀, 8 mi. W Carta Valley, Val Verde Co., 6 July 1948 (HEE) [MCZ]; 1 ♀, Alpine, Brewster Co., 29 May 1952 (Gertsch & Schramel) [AMNH]; 2 ♀♀, 2 ♂♂ (no further data) [MCZ]. NUEVO LEON: 1 ♀, Apodaca (A. Jiménez) [ENAC]; 3 ♀♀, 20 ♂♂, Vallecillo, 2-5 June 1951 (PDH, HEE) [AMNH, CU, MCZ, CIS]. VERACRUZ: 2 ♂♂, Medellin, Fall 1895 (H. Heyde) [USNM]; 1 ♀, 8 ♂♂, Veracruz, 1-6 Aug. 1961 (RRD) [MSU].

Psorthaspis laevifrons (Cresson)

Ferreola laevifrons Cresson, 1869, Proc. Boston Soc. Nat. Hist., 12: 376 [Type: ♀, MEXICO: VERACRUZ: Orizaba (ANSP, no. 436)].

Pompilus imperialis Smith, 1879, Descr. N. Sp. Hymen. Brit. Mus., p. 155 [Type: ♂, COSTA RICA: Caché (H. Rogers) (BMNH, no. 19, 695)]. — Cameron, 1893, Biol. Centr.-Amer., Hymen. II, p. 196. New synonym.

Pompilus laevifrons Cameron, 1893, Biol. Centr.-Amer., Hymen. II, p. 189.

Pompilus telemon Cameron, 1893, *ibid.*, p. 186 [Type: ♀, GUATEMALA: San Geronimo (GCC) (BMNH, no. 19, 308)].

Pompilus (Pedinaspis) laevifrons Fox, 1897, Ent. News, 8: 33.

Pedinaspis (Psorthaspis) laevifrons Banks, 1912, Jour. N. Y. Ent. Soc., 19: 231.

Idopedinaspis laevifrons Haupt, 1936, Boll. Ist. Ent. Bologna, 9: 75.

Psorthaspis laevifrons Bradley, 1944, Trans. Amer. Ent. Soc., 70: 45-46. — Evans, 1954, Amer. Mus. Novitates, no. 1662, pp. 3, 16.

This is presumably a relatively primitive member of the genus, as the clypeo-frontal bridge is narrow and depressed, the clypeus fairly broad, and the vertex not much elevated above the eye tops. This is the first of a series of species in which the claws of the male are all bifid, the inner ray being close to the outer ray and parallel to it; in the females the inner ray is strong and erect, the outer ray curved in such a way as to be nearly parallel to it.

Bradley placed *telemon* Cameron in tentative synonymy with *laevifrons*. I have seen the types of both these species and can con-

firm this synonymy. The type of *imperialis* is in poor condition and furthermore it is a "humbug", the head of the type of *Pompilus championi* Cameron being glued to the thorax and abdomen of *imperialis* (and the head of the *imperialis* type being glued to *championi*). The terminalia are missing, as are most of the tarsi. The limited amount of erect hair on the body eliminates it as the male of *eubule* or *bradleyi*, but it might possibly represent the otherwise unknown male of *coelestis*. The specimen from Xucumanatlán, Guerrero, referred to *imperialis* by Cameron, is a male *eubule*. Since the male of *laevifrons* has not previously been described, I have described in detail a male taken at the same time and place as a female and certainly the male of *laevifrons*. Since Bradley has redescribed the type female of this species in detail, I shall present only a few pertinent characters for this sex.

Female. — Length 13.5-19 mm. Black, body and wings rendered by the pubescence a rich blue or violaceous. Front, thoracic dorsum, and all coxae with sparse, short, erect setae. Clypeus 1.6 X as wide as high, its anterior margin truncate. Clypeo-frontal bridge in the form of a small ridge which is much below the level of the spatium frontale. Head about 1.15 X as wide as high; front relatively narrow for the genus, MID .61-.64 X TFD; UID slightly exceeding LID. Ocelli in a triangle the front angle of which is slightly greater than a right angle; POL:OOL = 3:4; posterior ocelli removed from vertex crest by .8 to 1.0 X POL, vertex depressed laterad of each posterior ocellus. Crest of vertex rather sharp, passing across a very short distance above eye tops. Pronotum short for the genus; propodeum strongly transversely rugose. Hind tibiae with strong spines above. Claws with the inner tooth strong, erect, the outer ray curved in such a way as to be nearly parallel to it.

Plesiallotype. — ♂, MEXICO: CHIAPAS: San Cristobal las Casas, 7500 feet, 30 April 1959 (HEE) [MCZ].

Description of plesiallotype male. — Length 11 mm.; fore wing 10 mm. Black, rendered a rich deep blue by the pubescence; lower half of front, to edge of clypeus, with coarse, silvery pubescence; wings fuscous, violaceous, the fore wings with bluish setulae. Moderately dense, rather short erect hairs present on scape, clypeus, front, vertex, temples, thoracic dorsum and pleura, propodeum, coxae, and abdominal venter; femora and dorsum of abdomen with only a few weak, short setae (as compared to *bradleyi* the body hairs are shorter and very much less dense). Clypeus 1.4 X as wide as high, its apical margin weakly rounded. Head 1.05 X as wide as high; MID .65 X TFD; eyes strongly diverging above, UID 1.22 X LID. POL:OOL = 3:4; vertex depressed laterad of each posterior ocellus, as in female. Third antennal seg-

ment about 1.4 X as long as thick, segments 4-12 each about 1.6 X as long as thick. Propodeum sloping very gradually in front, with a short, oblique declivity, the sides of the declivity barely produced. Claws strongly bifid, the inner ray long, subtruncate; inner claws of front tarsi slightly more curved than others, inner ray broader and more lobe-like. SGP short, its sides weakly angulate, the apex subtruncate (fig. 70); median line strongly elevated, the elevation strongly arched in profile. Genitalia with the parameres short, parallel-sided, abruptly truncate apically; base of digitus with a larger number of smaller setae than in *guatemalae*, and the aedoe gas more slender than in that species, but otherwise very similar.

Distribution. — Southern Mexico to Costa Rica. (Map 16.)

Specimens examined. — 14 ♀♀, 3 ♂♂. VERACRUZ: 1 ♀, Orizaba [type, ANSP]; 1 ♂, Orizaba, 12 Aug. 1961 (RRD) [MSU]. CHIAPAS: 1 ♀, 1 ♂, San Cristobal las Casas, 7500 feet, 29-30 April 1959 (HEE) [MCZ]. GUATEMALA: 1 ♀ (no further data) [MCZ]; 1 ♀, Antigua, 17 June 1923 (E. G. Smyth) [CU]; 1 ♀, Livingston, 18 April 1923 (E. G. Smyth) [USNM]; 5 ♀♀, San Gerónimo (GCC) [BMNH]. NICARAGUA: 1 ♀, El Carmen, Nueva Segovia, 2 Oct. 1953 (S. Segueira) [USNM]. COSTA RICA: 1 ♂, Caché (H. Rogers) [BMNH]; 1 ♀, Turrialba, 13 June 1949 (K. W. Cooper) [USNM]; 2 ♀♀, Turrialba, Aug. 1963 (CCP) [MCZ].

Psorthaspis coelestis Bradley

Idopedinaspis sp. Haupt, 1930, Mitt. Zool. Mus. Berlin, 16: 724, 783, 785, figs. 82, 84C (Costa Rica).

Psorthaspis coelestis Bradley, 1944, Trans. Amer. Ent. Soc., 70: 46-47 [Type: ♀, COSTA RICA: San Carlos, Alajuela (Schild & Bergdorf) (USNM, no. 57, 927)].

This is the largest known species of *Psorthaspis*. It is known only from the type and may, of course, be found to exhibit considerable variation in size.

Female. — Length 24 mm.; fore wing 19 mm. Black, pubescence reflecting bluish-green. Clypeus truncate apically. Head 1.1 X as wide as high; MID .64 X TFD; UID slightly exceeding LID. POL:OOL = 5:8; posterior ocelli removed from vertex crest by 1.25 X POL; vertex, in anterior view, almost straight across. Area frontalis with a narrow ridge as in *laevifrons*, but the ridge on a level with the front, barely below that of clypeus. Propodeum transversely rugose, but sides of dorsal surface less prominent than in *laevifrons*; dorsal surface with a median groove. Ultimate segments of middle and



hind tarsi with one or two pairs of lateral spines beneath before apical pair. Claws with apical ray curved until almost perpendicular, parallel to inner ray.

Distribution. — Costa Rica; known only from the type. (Map 18.)

***Psorthaspis guatemalae* Bradley**

Psorthaspis guatemalae Bradley, 1944, Trans. Amer. Ent. Soc., 70: 43-44 [Type: ♀, GUATEMALA: Trece Aguas, Alta Vera Paz, Nov. 1905 (G. P. Goll) (USNM, no. 57, 925)].

This species is distinctive because of its small size and the weak rugae on the propodeum. The male is described here for the first time.

Female. — Length 14 mm.; fore wing 11 mm. Black, pubescence reflecting green to violet; wings fuscous, violaceous. Clypeus truncate apically. Head 1.1 X as wide as high; MID .64 X TFD. POL:OOL = 17:23; posterior ocelli removed from vertex crest by slightly less than POL. Clypeo-frontal bridge narrow, acute, on same plane as clypeus and front. In frontal view, vertex convex from the corner of one eye to that of the other, except for a weak median concavity. Vertex depressed laterad of posterior ocelli, as in *laevifrons*. Propodeum with smoother contours than in *laevifrons*, and the

rugae weaker than in that species. Claws with the outer ray rather strongly curved, nearly parallel to inner ray.

Plesiallotype. — ♂, MEXICO: MORELOS: 4 mi. E of Cuernavaca, 18 June 1959, 6000 feet (HEE) [MCZ].

Description of plesiallotype male. — Length 8 mm.; fore wing 7 mm. Black, pubescence of body and legs brilliantly bluish, with some blue-green reflections; pubescence of face light brown. Clypeus, scape, front, and temples with rather long, dense, dark hairs; thorax, propodeum, coxae, and femora with abundant setae of moderate length; abdomen wholly clothed with sparse, erect or semierect setae, including the dorsum (in general, the body is considerably more hairy than in *laevifrons*, about the same as in *eubule*, less hairy than in *bradleyi*). Clypeus 1.6 X as wide as high, its apical margin evenly rounded. Head 1.15 X as wide as high; vertex elevated in an even arc between tops of eyes. MID .69 X TFD; UID 1.3 X LID; POL:OOL = 10:13; posterior ocelli removed from vertex crest by less than twice their own diameters. Antennae relatively short, segment three barely longer than thick, segments 4-12 each about 1.25 X as long as thick. Slope of propodeum rather low, slightly steeper on posterior third than anteriorly; sides of dorsum not humped; postero-lateral angles not at all prominent. Claws cleft, inner ray subacute except on inner front tarsal claws, where the inner ray is rounded, lobe-like. SGP keeled, elongate, tapering to a subacute apex (fig. 67). Parameres of genitalia not swollen apically, abruptly truncate; digiti with the setulae absent over most of the center and mesal surface of the disc (fig. 28).

Distribution. — Guatemala and southern Mexico. (Map 18.)

Specimens examined. — 1 ♀, 2 ♂♂. GUATEMALA: 1 ♀, Trece Aguas [type, USNM]. MEXICO: MORELOS: 1 ♂, 4 mi. E Cuernavaca, June (HEE) [MCZ]; VERACRUZ: 1 ♂, Jalapa, 28 Sept. 1961 (RRD) [MSU].

Variation. — In the Jalapa male, antennal segments 4-12 are each about 1.4 X as long as thick, the SGP slightly less slender than figured.

Psorthaspis regalis (Smith)

Pompilus regalis Smith, 1862, Jour. Ent., 1: 396 [Type: ♀, MEXICO: (no further data) (BMNH, no. 19, 306)]. — Cameron, 1893, Biol. Centr.-Amer., Hymen II, p. 200.

Psorthaspis banksi Bradley, 1944, Trans. Amer. Ent. Soc., 70: 55 [Type: ♀, MEXICO: VERACRUZ: Orizaba (ANSP)]. Synonymy by Evans, 1954.

Psorthaspis regalis Evans, 1954, Amer. Mus. Novitates, no. 1662, p. 6.

Examination of the type of *regalis* reveals that the claws are of

the form characteristic of *laevifrons* and its allies, rather than of the form characteristic of *vicina* and *macronotum* as I had previously supposed. Thus the species will not key out properly in the key I presented in 1954. The male of this species has not previously been recognized, but I feel fairly confident that the male described below belongs with this species.

Description of type female. — Length 21 mm.; fore wing 14.5 mm. Black, body and legs wholly covered with brilliant bluish pubescence; wings fuscous, violaceous. Erect setae short and inconspicuous on head, pronotum, and apex of abdomen; front coxae setose; body otherwise without erect setae. Head unusually long, measuring about .9 X as wide as long. Clypeus large and flat, 1.25 X as wide as high, its apical margin weakly emarginate. Clypeo-frontal bridge narrow, round-topped, not depressed below level of clypeus and front. Front broad, MID .66 X TFD, 1.14 X LID, .90 X height of eye; UID 1.0 X LID. POL:OOL = 19:32; posterior ocelli removed from vertex crest by 1.6 X POL. First four antennal segments in a ratio of about 25:5:18:16, segment three 3 X as long as thick, .4 X UID. Vertex, in anterior view, weakly concave, distance from eye tops to vertex crest immediately above them subequal to WOT; vertex seen from above strongly concave, fitting around the anterior extension of the prothorax. Pronotum moderately long, disc two-thirds as long as its maximum width, disc on a slightly higher plane than the collar. Propodeum with a median impression and with numerous strong transverse rugae behind; surface somewhat humped behind spiracles; declivity abrupt, weakly concave. Middle and hind tibiae with numerous strong spines above. Claws with the tooth rather long, the outer ray strongly curved so as to be nearly parallel to the tooth; apical tarsal segments not spined beneath. Fore wing with SMC3 narrower both above and below than SMC2. Abdomen slender, very strongly compressed toward the apex.

Plesiallotype. — ♂, MEXICO: MORELOS: 3 mi. NW Cuernavaca, 6500 feet, 28 June 1959 (HEE) [MCZ].

Description of plesiallotype male. — Length 14 mm.; fore wing 13.5 mm. Black, pubescence of body and legs bluish, with some violaceous reflections; face and lower front with coarse, grayish pubescence; wings fuscous, violaceous. Head, thorax, propodeum, coxae, and femora clothed with short, dark hairs, these hairs considerably denser than in *laevifrons*, but less dense and considerably shorter than in *bradleyi*; abdomen with a considerable amount of suberect dark hair, but that on the basal two tergites sparse and inconspicuous. Head very slightly wider than high; vertex elevated in an even arc above eyes, except very slightly humped at and behind ocellar triangle. Clypeus 1.3 X as wide as high, its apical margin subtruncate, actually very weakly convex. MID .65 X TFD; eyes strongly diverging above, UID 1.3 X LID. POL:OOL =

4:5; posterior ocelli removed from vertex crest by about two-thirds X POL. Antennae elongate, segment three 1.2 X as long as thick, segments 4-12 each about 1.6 X as long as thick. Propodeum somewhat humped along the sides of the dorsum, the postero-lateral angles roundly prominent; in profile, slope much steeper on posterior third than anteriorly. Claws strongly bifid, inner ray subtruncate (except inner front claws, in which the inner ray is rounded, lobe-like.) SGP strongly keeled, without lateral angulations, shaped much as in *bradleyi* but somewhat shorter and considerably wider on the basal half (fig. 68). Parameres of genitalia decidedly swollen and club-like apically, the genitalia not otherwise differing notably from those of *guatemalae*, shown in fig. 28.

Distribution. — Central and southern Mexico. (Map 18.)

Specimens examined. — 3 ♀♀, 3 ♂♂. MEXICO: 1 ♀ (no further data) [type, BMNH]; VERACRUZ: 1 ♀, Orizaba [type of *banksi*, ANSP]; MORELOS: 3 ♂♂, 3 mi. NW Cuernavaca, 26-28 June 1959, 6500 feet (HEE) [MCZ]; CHIAPAS: 1 ♀, Simojovel, 17 March 1953 (EIS) [CIS].

Variation. — The two other males from Morelos are smaller, the fore wing measuring 10.5 and 12.5 mm. In both specimens the pubescence of the face and lower front is conspicuously silvery. In both specimens antennal segments 4-12 are only about 1.5 X as long as thick. The Chiapas female is 18 mm. long, not counting the very long sting.

Psorthaspis eubule (Cameron)

Pompilus eubule Cameron, 1893, Biol. Centr.-Amer., Hymen. II, p. 187 [Type: ♀, MEXICO: GUERRERO: Amula, 6000 feet (H. H. Smith) (BMNH, no. 19, 307)]. — Schulz, 1911, Zool Annalen, 4: 119.

Pompilus imperialis Cameron, 1893, *ibid.*, p. 196 (in part; ♂, Xucumanatlán, Guerrero; not *imperialis* Smith, misidentification).

Psorthaspis eubule Bradley, 1944, Trans. Amer. Ent. Soc., 70: 78. — Evans, 1954, Amer. Mus. Novitates, no. 1662, p. 3.

This species is known from only two specimens, both from high altitudes in Guerrero.

Description of type female. — Length 16 mm.; fore wing 13.5 mm. Black, body and legs covered with brilliant bluish-violaceous pubescence; wings fuscous, violaceous. Erect setae short but numerous on head, pronotum, coxae, and to some extent the femora; abdomen setose ventrally and apically. Clypeus 1.45 X as wide as high, its apical margin convexly rounded; disc flat. Clypeo-frontal bridge narrow, round-topped, not depressed below level of cly-

peus and front. MID .64 X TFD, 1.2 X LID, .95 X eye height; UID 1.04 X LID. POL:OOL = 8:13; posterior ocelli removed from vertex crest by 1.1 X POL. First four antennal segments in a ratio of about 21:6:14:14; segment three 2.5 X as long as thick, .34 X UID. Vertex passing straight across immediately above eye tops, as seen from above only weakly concave. Pronotum with disc .6 as long as its maximum width; collar barely depressed below level of disc. Propodeum with a median impression and with numerous transverse rugae; center of declivity weakly concave. Middle and hind tibiae with numerous spines above; apical tarsal segments not spined beneath. Claws with the tooth long, the outer ray strongly curved so as to be subparallel to the tooth. SMC3 slightly narrower below than SMC2, much narrower above than SMC2, third intercubital vein strongly arched. Abdomen weakly compressed apically.

Plesiallotype. — ♂, MEXICO: GUERRERO: Xucumanatlán, 7000 feet, July (HHS) [BMNH].

Description of plesiallotype male. — Length 9.5 mm.; fore wing 9 mm. Black, pubescence conspicuously bluish-violaceous; wings fuscous, violaceous; front without pale pubescence. Head, thorax, propodeum, coxae, and femora all clothed rather densely with dark, erect hair, about as in the preceding species but the hairs shorter and less dense than in *bradleyi*; abdomen with suberect hairs above and below, the first tergite with a considerable amount of hair basally. Head 1.07 X as wide as high; vertex forming an even arc above eye tops. Clypeus 1.4 X as wide as high, its apical margin strongly rounded. MID .69 X TFD; eyes strongly diverging above, UID 1.3 X LID. POL:OOL = 12:17; posterior ocelli removed from vertex crest by about .5 X POL. Antennae elongate, segment three 1.4 X as long as thick, segments 4-12 each about 1.6 X as long as thick. Propodeum with the slope rather low, only slightly steeper on posterior third than anteriorly, sides of dorsum not humped and postero-lateral angle not prominent. Claws bifid, inner ray subacute except that of inner front claws rounded. SGP strongly keeled, shaped much as in *regalis* but shorter and broader (fig. 69). Parameres of genitalia in the form of short, abruptly truncate rods, not swollen apically; disc of digiti with most of the setae on the margin, leaving a large central area smooth; genitalia almost exactly as figured for *guatemalae* (fig. 28) except volsellae with a larger number of setae below the digitus, and parameres with a larger number of setae on their mesal surfaces.

Distribution. — Known only from the type and plesiallotype, from Guerrero, Mexico. (Map 16.)

Psorthaspis bradleyi Evans

Psorthaspis bradleyi Evans, 1954, Amer. Mus. Novitates, no. 1662, pp. 3-5

[Type: ♀, MEXICO: ZACATECAS: 15 km. E Sombrerete, about 7300 feet, 28-31 July 1951 (HEE) (AMNH)].

Female. — Length 16-26 mm. Black; pubescence purple, grading into bluish on the legs, apex of abdomen, and fore wing; wings fuscous, violaceous. Front, vertex, and entire thorax and propodeum, including legs to femora, with a thin covering of short, erect setae. Head 1.05 X as wide as high. Clypeus 1.4 X as wide as high, its apical margin evenly convex. Clypeo-frontal bridge narrow, round-topped, not at all depressed below level of front and clypeus. MID .70 X TFD, 1.15 X height of eye; UID 1.05 X LID. OOL about 1.5 X POL; distance from posterior ocelli to vertex crest about 1.3 X POL. In front view, vertex extending beyond a line connecting eye tops by a distance slightly greater than length of second antennal segment. Pronotum .7 as long as its maximum width; collar not depressed below level of disc medially. Propodeum with very strong rugae. Claws as in the preceding species. Abdomen weakly compressed apically.

Male. — Length 9-16 mm. Color as in female. Scape densely hairy; entire head, thorax, and propodeum with dense, long, dark hairs; coxae, trochanters, and femora densely hairy, tibiae slightly so; abdomen densely hairy, even dorsally. Head in anterior view nearly circular, very slightly wider than high; vertex elevated in an even arc above eyes. Clypeus about 1.5 X as wide as high, its apical margin convex. MID .68 X TFD; UID 1.1 X LID; OOL 1.3 X POL. Antennae elongate, segment three about 1.3 X as long as thick, segments 4-12 each about 1.7-1.9 X as long as thick. Propodeum with a short, oblique declivity. Claws bifid, the inner ray subacute. SGP long and slender, without lateral angulations, strongly keeled medially (see fig. 1 in Evans, 1954). Genitalia with the parameres squarely truncate; digiti club-shaped, the apex scarcely produced medially.

Distribution. — West-central Mexico, states of Zacatecas and Durango, at altitudes of 7300-8500 feet. (Map 18.)

Specimens examined. — 8 ♀♀, 10 ♂♂. ZACATECAS: 3 ♀♀, 10 ♂♂, 15 km. E of Sombrerete, about 7300 feet, 28-31 July 1951 (HEE & PDH) [AMNH, USNM, CU, CIS, MCZ]. DURANGO: 3 ♀♀, Palos Colorados, 8000 feet, 5 Aug. 1947 (WG) [AMNH]; 1 ♀, Coyotes, 8300 feet, 8 Aug. 1947 (MC) [AMNH]; 1 ♀, 6 mi. NE El Salto, 8500 feet, 10 Aug. 1947 (R. Schrammel) [AMNH].

Psorthaspis planata (Fox)

Planiceps planatus Fox, 1892, Ent. News, 3: 171 [Type: ♀, CALIFORNIA: San Diego (F. E. Blaisdell) (ANSP)].

Pompilus aequus Fox, 1894, Proc. Calif. Acad. Sci., (2)4: 99 [Type: ♀,

- MEXICO: BAJA CALIFORNIA: El Taste (CAS)]. Synonym by Bradley, 1944.
- Pompilus (Pedinaspis) planatus* Fox, 1897, Ent. News, 8: 33.
- Parapompilus planatus* Davidson, 1905, Ent. News, 16: 233 (biology).
- Pedinaspis (Pedinaspis) planatus* Banks, 1912, Jour. N. Y. Ent. Soc., 19: 231.
- Sophropompilus tumifrons* Banks, 1917, Bull. Mus. Comp. Zool., 61: 103 [Type: ♂, CALIFORNIA: San Diego Co. (E. P. Van Duzee) (MCZ, no. 10, 016)]. — Banks, 1919, Bull. Mus. Comp. Zool., 63: 238. Synonym by Bradley, 1944.
- Psorthaspis planatus* Banks, 1919, *ibid.*, p. 241. — Bradley, 1944, Trans. Amer. Ent. Soc., 70: 52-54. — Evans, 1954, Amer. Mus. Nov., no. 1662, p. 12.
- Pedinaspis bucephala* Malloch, 1928, Proc. Ent. Soc. Wash., 30: 101 [Type: ♂, CALIFORNIA: Palm Springs, 9 Aug. 1917 (E. G. Holt) (USNM, no. 27, 431)]. Synonym by Bradley, 1944.
- Pedinaspis albocaudata* Malloch, 1928, *ibid.*, p. 101 [Type: ♂, ARIZONA: Higley, 27 June 1917 (E. G. Holt) (USNM, no. 27, 432)]. Synonym by Evans, 1958, Ent. News, 69: 148-149.
- Pedinaspis planatus* Jenks, 1938, Nat. Geogr. Mag., 74: 807-828 (biology).
- Allocyphonix albocaudatus* Bradley, 1944, Trans. Amer. Ent. Soc., 70: 152.
- Psorthaspis morosa* Bradley, 1944, *ibid.*, p. 42 [Type: ♀, Utah (USNM, no. 57, 923)]. Synonym by Evans, 1954.

As the long synonymy suggests, this is a highly variable species. It is a reasonably common species within its somewhat restricted range, and might provide a worthwhile subject for a detailed study of variation. Males from Arizona and from east of the coast ranges in southern California have a large amount of whitish pubescence on the apex of the abdomen (*albocaudata* Malloch). It is possible that this represents an introgression of genes from the closely related species *portiae*. Baja California females have the head unusually thin and broad and the claws more strongly dentate and with the outer ray more strongly curved (*aequus* Fox). I question whether these differences are sufficiently clear-cut to justify the use of sub-specific names, but further study is clearly desirable.

Female. — Length 9-22 mm. Black, pubescence bluish or violaceous, often with some greenish-blue reflections; Baja California specimens generally with the pubescence of the front of the head pale, grayish or somewhat silvery; wings fuscous, violaceous. Front and thoracic dorsum with the erect hair short and relatively sparse; propodeum and femora not or barely hairy. Clypeus flat, its apical margin weakly rounded. Clypeo-frontal bridge broad, on same plane as clypeus and front, its flat top nearly or fully as wide as an antennal

socket. Eyes diverging above, UID about 1.1 X LID; vertex extended somewhat above eye tops, extending straight across or slightly concave in the middle; distance from posterior ocelli to vertex crest equal to about 1.5 (1.3-1.8) X POL. Propodeum with strong transverse rugae and with a strongly defined, slightly concave declivity. Hind tibiae with several spines above. Claws dentate, Baja California specimens with the claws rather strongly curved and the tooth strong, almost as in *laevifrons*, *bradleyi*, and their allies. Abdomen weakly compressed apically.

Male. — Length 8-13 mm. Black, pubescence extensively bluish or somewhat violaceous, often entirely so, but specimens from southern parts of the range often with silvery pubescence on the lower front and temples, specimens from Arizona and southeastern California also with silvery pubescence on the posterior margin of the pronotum and on the apical abdominal tergites (in some Baja California specimens the pubescence of the apical tergite is grayish or somewhat silvery); wings fuscous, violaceous. Front with rather dense, short setae, but body setae otherwise short and sparse except more numerous toward tip of abdomen. Clypeus rounded below. Antennae of moderate, rather variable length; segments 4-12 each from 1.25-1.7 X as long as thick. Eyes strongly diverging above; upper front rather strongly convex; vertex much elevated above eye tops and weakly to strongly humped in the ocellar triangle, which is very broad and flat. Propodeum elongate, with a short, concave declivity on the sides of which it is rather strongly produced backward. Claws bifid, inner ray acute or subacute, except inner claws of front tarsi with inner ray rounded, lobe-like. SGP tapering to a subacute apex, its median ridge strong, arched in profile; sides dentate well before apex. Genitalia not differing notably from those of other species of the genus, the parameres short, truncate, not swollen apically.

Distribution. — Central California and Utah to Arizona and Baja California. (Map 19.)

Mexican specimens examined. — 11 ♀♀, 12 ♂♂. BAJA CALIFORNIA: 1 ♂, 20 mi. N Mesquital, 27 Sept. 1941 (ESR & GEB) [CAS]; 1 ♀, Isla Partida, Gulf of Calif., 23 Mch. 1953 (P. H. Arnaud) [CAS]; 2 ♂♂, Cedros Island, 3 June 1925 (H. H. Keifer) [CAS]; 1 ♀, 3 mi. NW Miraflores, 19 Jan. 1959 (HBL) [CAS]; 1 ♀, El Taste [CAS]; 6 ♀♀, 6 ♂♂, La Paz, 10-12 Oct. 1954 (FXW) [CAS]; 2 ♀♀, 3 ♂♂, 25 mi. W La Paz, 4 Sept. 1959 (Radford & Werner) [UA].

Psorthaspis portiae portiae (Rohwer)

Pedinaspis (*Psorthaspis*) *portiae* Rohwer, 1920, Proc. U. S. Nat. Mus., 57: 228 [Type: ♀, ARIZONA: Sabinal Basin, 17 Sept. 1918 (C. H. T. Townsend) (USNM, no. 22, 032)].



Psorthaspis portiae Bradley, 1944, Trans. Amer. Ent. Soc., 70: 56-57.

Psorthaspis portiae portiae Evans, 1954, Amer. Mus. Nov., no. 1662, pp. 12-13 (Chihuahua, Durango, Zacatecas; ♂ described).

This species is closely related on the one hand to the all-black *planata*, on the other hand to the brightly-colored, banded-winged species *formosa* (Smith). These species are largely allopatric, but the differences are sufficiently great so that it seems best to consider them three full species constituting a superspecies. *Portiae* itself falls into two rather distinct subspecies.

Female. — Length 12-21 mm. Color black, except apical abdominal tergites somewhat ferruginous, the integument largely concealed by very heavy orange tomentum on the upper front and temples, vertex, pronotum except extreme sides, mesoscutum, tegulae, base of scutellum, apical half of T2 and all of T3-6; pubescence of S3-6 finer and somewhat paler; pubescence elsewhere violaceous, with bluish and blue-green reflections; wings fuscous, usually weakly violaceous, tips of fore wings often rather pale. Features of head essentially as in *planata*, the clypeo-frontal bridge broad and flat-topped as in that species; distance from posterior ocelli to vertex crest 1.4-1.8 X POL. Propodeum with strong transverse rugae, especially on the sides of the declivity and margining

the declivity anteriorly. Claws strongly curved and with the tooth large, about as in Baja California specimens of *planata*.

Male. — Length 6-12 mm. Black; pubescence coarse, silvery over much of the body, dark and somewhat violaceous at least on parts of the thoracic dorsum, basal half of the propodeum, and apical margins of T1 and 2, also often extending along the median line to or toward the base of the first two tergites, so that the silvery pubescence is partly or wholly divided into lateral spots; wings completely hyaline, with brownish veins, or occasionally the fore wing with a weak apical fuscous band. Body with a considerable amount of white erect hair; front, vertex, thoracic dorsum and pleura, and propodeum with rather abundant short to fairly long white hair; coxae and femora also with short hair. Antennae of rather variable length, segment four from 1.3 to 1.7 X as long as thick. Vertex strongly humped just behind the ocellar triangle. Sides of propodeal declivity strongly produced backward, as in *planata*, and the claws as in that species. SGP as figured by Evans, 1954, fig. 3, neither the plate nor the genitalia differing notably from those of *planata*.

Distribution. — Southern Arizona to Sinaloa and Jalisco, east to Nuevo Leon. (Map 19.)

Specimens examined. — 49 ♀♀, 43 ♂♂. ARIZONA: 1 ♀, 1 ♂, Santa Catalina Mts., Aug., Sept. [MCZ]; 1 ♀, Sabinal Basin, Sept. (Townsend) [USNM]; 2 ♀♀, 1 ♂, Apache, Cochise Co., 27 July (HEE) [MCZ, CU]; 1 ♀, Chiricahua Mts., Sept. (J. A. Kusche) [CAS]; 2 ♀♀, Douglas, Aug., Sept. (W. W. Jones) [USNM, CU]; 1 ♂, Santa Rita Mts., July (R. H. Beamer) [KU]; 1 ♂, Sabino Canyon, Santa Catalina Mts., May (G. D. Butler) [UA]; 1 ♀, 8 mi. N Sonoita, July (W. Nutting) [MCZ]; 1 ♀, Sonoita, July (J. O. Martin) [CAS]; 1 ♀, 8 mi. W Nogales, 6000 feet, July (Werner & Nutting) [MCZ]; 2 ♀♀, Baboquivari Mts., Sept., Oct. (O. C. Poling) [CAS]. SONORA: 2 ♀♀, 1 ♂, 10 mi. E Navajoa, 13 Aug. 1959 (Werner & Nutting) [UA]. SINALOA: 1 ♂, Culiacan, 5 May 1953 (EIS) [CIS]; 1 ♀, Los Mochis, 16 Sept. 1947 (M. Marquis) [CAS]. CHIHUAHUA: 1 ♀, Salaices, 23 July 1947 (Spieth) [AMNH]; 1 ♀, Santa Barbara, 6300 feet, 17 July 1947 (WG) [AMNH]; 1 ♂, Chihuahua, 12 Aug. 1951 (PDH) [CIS]; 2 ♂♂, 16 mi. SE Chihuahua, 11 July 1947 (WG) [AMNH]; 1 ♂, 27 mi. S Chihuahua, 7 Sept. 1950 (RFS) [AMNH]; 1 ♀, Santa Clara Canyon, 5 mi. W Parrita, 6 July 1954 (JWM) [CIS]; 1 ♀, 32 mi. S Hidalgo de Parral, 21 Aug. 1960 (D. C. Rentz) [CAS]; 1 ♂, 9 mi. E Parral, 11 Sept. 1950 (RFS) [AMNH]; 1 ♂, 42 mi. SW Camargo, 4900 feet, 15 July 1947 (CDM) [AMNH]. DURANGO: 12 ♀♀, 4 ♂♂, 8 mi. S Canutillo,

9 Aug. 1951 (HEE & PDH) [MCZ, CIS, CU]; 5 ♀♀, Palos Colorados, 8000 feet, 5 Aug. 1947 [AMNH]; 11 ♂♂, 14 mi. NW Ceballos, 10 Sept. 1963 (HAS) [OSU]; 4 ♀♀, 2 ♂♂, Nombre de Dios, Aug. (HEE & PDH) [CIS, MCZ]; 2 ♀♀, 1 ♂, Encino, 6200 feet, 27 July 1947 [AMNH]; 2 ♂♂, Yerbani, Cuencame Dist., 6700 feet, 19 Aug. 1947 (MC) [AMNH]; 3 ♀♀, Las Puentes, 7500 feet, 24 July 1947 [AMNH]; 1 ♀, Durango, 6000 feet, 22 Oct. 1957 (HAS) [OSU]. ZACATECAS: 7 ♂♂, 15 km. E Sombrerete, 28-31 July 1951 (HEE, PDH) [CIS, MCZ, CU]; 2 ♂♂, Fresnillo, 7000 feet, 15 Aug. 1947 (CDM) [AMNH]. JALISCO: 1 ♂, La Primavera, 8 July 1956 (RRD) [MSU]; 2 ♀♀, Guadalajara, 25 July 1965 (HEE) [MCZ]. NUEVO LEON: 1 ♂, 4 mi. W El Cercado, 6 June 1951 (PDH) [CIS].

Psorthaspis portiae conocephala Bradley

Psorthaspis conocephala Bradley, 1944, Trans. Amer. Ent. Soc., 70: 67-68 [Type: ♂, TEXAS: Brownsville (J. C. Bridwell) (USNM, no. 57, 929)].

Psorthaspis portiae conocephala Evans, 1954, Amer. Mus. Nov., no. 1662, pp. 13-14 (Nuevo Leon).

Female. — Length 14-18 mm. Closely resembling *p. portiae*, but the orange tomentum generally slightly less coarse, absent from the head or present in limited amount on the vertex and occiput, extending on to the side pieces of the pronotum only slightly. Fore wing frequently abruptly paler on apical fourth. Propodeum coarsely rugose on the sides, the rugae reduced or absent medially.

Male. — Length 7-10.5 mm. Body with white hairs only on the temples, propleura, and to a lesser extent on the front, vertex, and thoracic dorsum and pleura; coxae and femora not at all hairy. Body almost entirely clothed with coarse silvery pubescence, this pubescence usually absent only from the posterior margins of the first two tergites. Other features as in *p. portiae*.

Distribution. — Texas and northeastern Mexico. (Map 19.)

Specimens examined. — 9 ♀♀, 8 ♂♂. TEXAS: 1 ♀, Wichita Falls, Sept. (W. McGregor) [CIS]; 1 ♀, Bexar Co., 27 Oct. 1931 [CIS]; 1 ♀, Kingsville (C. T. Reed) [MCZ]; 1 ♀, Hondo, Medina Co., 3 June 1909 (J. D. Mitchell) [USNM]; 3 ♀♀, 2 ♂♂, Pt. Isabel, Cameron Co., 20-27 June (HEE) [MCZ]; 1 ♀, (no further data) [ANSP]; 3 ♂♂, 5 mi. N Sinton, 7 May 1958 (HEE) [MCZ]. NUEVO LEON: 1 ♀, Apodaca, 8 June 1956 (R. Gonzales) [ENAC];

4 ♂♂, Vallecillo, 2-5 June 1951 (HEE) [MCZ, CU].

Psorthaspis formosa (Smith)

Ferreola formosa Smith, 1862, Jour. Ent., 1: 399 [Type: ♀, MEXICO: OAXACA: Oaxaca (BMNH, no. 19, 312)].

Salius tomentosus Taschenberg, 1869, Zeitschr. Ges. Naturw., 34: 70-72 [Type: ♀, MEXICO (no further data) (Zool. Inst., Halle, Germany)]. New synonym.

Pompilus formosus Cameron, 1893, Biol. Centr.-Amer., Hymen. II, p. 189.

Pompilus rinconensis Cameron, 1897, Ann. Mag. Nat. Hist., (6) 19: 375 [Type: ♀, MEXICO: GUERRERO: Rincon, 2800 feet, October (HHS) (BMNH, no. 19, 313)]. — Cameron, 1899, Biol. Centr.-Amer., Hymen. II, Suppl., p. 404. New synonym.

Pediaspis alternata Banks, 1931, Bull. Brooklyn Ent. Soc., 26: 132 [Type: ♂, MEXICO: YUCATAN: Chichen Itza, June 1929 (JB) (MCZ, no. 16, 537)]. New synonym.

Psorthaspis formosa Bradley, 1944, Trans. Amer. Ent. Soc., 70: 58-59. — Evans, 1954, Amer. Mus. Nov., no. 1662, p. 12.

Psorthaspis alternata Bradley, 1944, op. cit., pp. 69-70. — Evans, 1954, op. cit., pp. 12, 14.

The females of this species differ strikingly from *portiae* in the color pattern of the pubescence and in the banding of the wings. However, the structural differences are rather slight, and furthermore two specimens are known which are somewhat intermediate in color pattern between *portiae* and *formosa* (see below, under "Variation"). The type of *rinconensis* is a perfectly typical female *formosa*, and it seems clear from Taschenberg's description of *tomentosus* that he was also dealing with this species. Neither of these names was treated by Bradley in his revision of the Aporini. Since *alternata* Banks is sympatric with *formosa* and is known only from males which differ but slightly from *portiae* males, it seems virtually certain that it represents the male sex of *formosa*, as I suggested in 1954.

Description of type female. — Length 17 mm.; fore wing 11.5 mm. Color wholly black, strongly patterned with pubescence; front, vertex, upper temples, entire pronotum and mesoscutum, and T3 and 4 with heavy orange pubescence which obscures the integument; face, clypeus, legs, lower pleura, apical .8 of propodeum (except center of declivity), apex of T1 and base of T2, and all of S1-4 with somewhat finer silvery to glaucous pubescence; other parts with dark, violaceous pubescence. Fore wings strongly banded, both the membrane and the setulae dark in the bands; basal .2 dark, a dark band across the

basal and transverse median veins, and a broader dark band across wing through and below marginal cell; setulae between the bands coarse and somewhat milky in color, but the tip of the wing subhyaline, with minute setulae. Clypeus 1.4 X as broad as high, its apical margin very weakly rounded, disc flat. Clypeo-frontal bridge rather wide, flat-topped, on same plane as clypeus and front. Head 1.08 X as wide as high; MID .67 X TFD, subequal to eye height; UID 1.16 X LID. POL:OOL=9:15; posterior ocelli removed from vertex crest by 1.6 X POL. Antennal segment three about 3 X as long as thick, .32 X UID. Pronotum rather long, its disc 1.5 X as wide as long; collar on almost the same plane as the disc. Propodeum weakly impressed medially, with strong transverse rugae which are absent anteriorly and in the center of the declivity, which is concave. Claws with inner tooth erect, strong, subparallel to outer ray though not quite as long. Fore wing with SMC3 slightly wider above and below than second.

Description of type male of alternata. — Length 9 mm.; fore wing 8 mm. Black; pubescence extensively silvery or somewhat milky in color, very coarse, except dark and somewhat violaceous on the vertex, across pronotal disc, much of mesoscutum and scutellum, base of propodeum, and apex of T1 and 2. Wings very faintly clouded, fore wing more distinctly clouded in marginal cell and along outer wing margin. Body with short, suberect, whitish hairs in moderate abundance, including a few on the coxae and femora (about as in *portiae portiae*). Clypeus 1.6 X as wide as high, its apical margin rounded. Head 1.05 X as wide as high; MID .65 X TFD; eyes strongly diverging above, UID 1.5 X LID. POL very slightly exceeding OOL; vertex weakly humped just behind the ocellar triangle. Antennae rather short and compact, segment four measuring 1.4 X as long as wide. Postero-lateral angles of propodeum very prominent. Claws bifid, the inner ray subtruncate except in the case of the inner claws of the front tarsi, where the inner ray is lobe-like. Venation not differing notably from that of the female or from that of related species. Terminalia indistinguishable from those of *planata* and *portiae*.

Distribution. — Central Mexico to Costa Rica. (Map 19.)

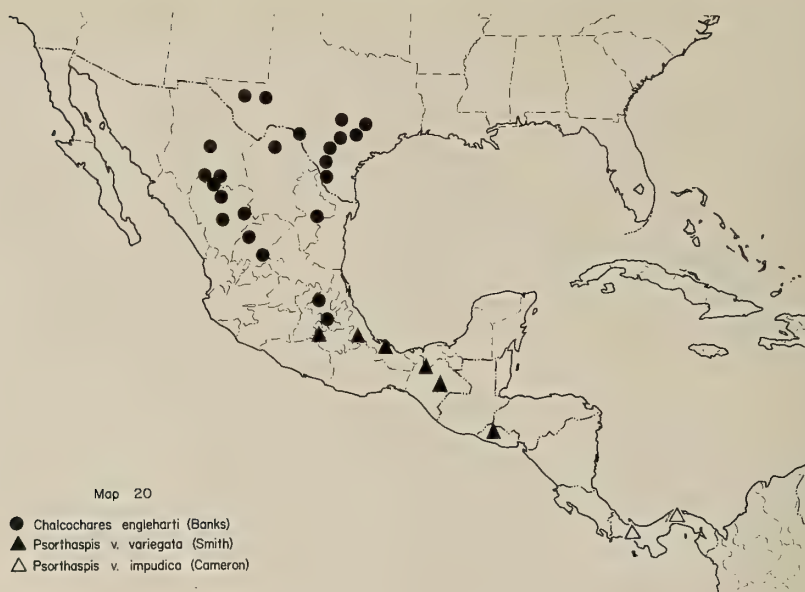
Specimens examined. — 11 ♀♀, 22 ♂♂. MEXICO: 1 ♀ (no further data) [USNM]. SINALOA: 1 ♀, Mazatlan, 25 July 1918 (J. A. Kusche) [CAS]. GUERRERO: 1 ♀, Rincon, 2800 feet, Oct. (HHS) [BMNH]; 1 ♀, Iguala (Hoege) [BMNH]; 1 ♂, 3 mi. N Taxco, 5500 feet, 1 June 1959 (HEE) [MCZ]. MORELOS: 1 ♀, Canyon de Lobos, nr. Yautepec, 13 March 1959 (HEE) [CU]; 1 ♀, S end Cuernavaca, 4500 feet, 11 May 1959 (HEE) [MCZ]; 1 ♂, 5 mi. S Cuernavaca, 5 May 1962 (LS) [UCD]; 2 ♂♂, 3 mi. N Alpuyecá, 3400 feet, 3 April 1959 (HEE) [MCZ, CU]. MEXICO: 1 ♀, Teotihuacan, 7500 feet, 3 July 1959 (HEE) [MCZ]; 1 ♂, Ixtapan de la Sal, 5500 feet, 9 Aug. 1954 [KU]. PUEBLA: 3 ♀♀,

3 mi. N Petlalcingo, 2 Apr. 1962, 3 Aug. 1963 (LS) [UCD]. VERA-CRUZ: 12 ♂♂, Minatitlan, 26 Aug. 1961 (RRD) [MSU]. OAXACA: 1 ♀, Oaxaca [type, BMNH]; 1 ♂, 24 mi. SE Oaxaca, 22 Aug. 1963 (HAS) [OSU]. YUCATAN: 1 ♂, Chichen Itza, June 1929 (JB) [MCZ]; 2 ♂♂, Progreso, 23 July 1962 (HEE) [MCZ]. CHIAPAS: 2 ♂♂, 20 mi. S Tuxtla Gutierrez, 12 Aug. 1963 (FDP) [UCD]. COSTA RICA: 1 ♂, 12 mi. SW Cañas, Guanacaste Prov., 27 Feb. 1964 (HEE) [MCZ].

Variation. — The males vary in length from 6 to 10 mm., fore wing from 5.5 to 8.5 mm. In the three Morelos specimens and the one from Oaxaca the vertex is not at all elevated behind the ocellar triangle. Antennal segment four varies from 1.2 to 1.4 X as long as wide. There is no important variation in wing color, but there is considerable variation in the color of the pubescence on the apical half of the abdomen (T3 and beyond). In the male from 5 mi. S Cuernavaca and in those from Oaxaca, Chiapas, and Costa Rica the pubescence here is bright orange similar to that on T3 and 4 of the female. In the series from Minatitlan, there is variation in the pubescence of the apical part of the abdomen all the way from silvery through yellowish to bright orange. In this series, also, much variation can be noted in degree to which the vertex is humped behind the ocelli.

The available females vary in length from 13 to 17 mm., the fore wing from 9 to 11.5 mm. In smaller specimens the vertex tends to be less strongly extended above the tops of the eyes and ocelli; in the Canyon de Lobos specimen the distance from the posterior ocelli to the vertex crest is only 1.3 X POL. In the female from Sinaloa there are small, paired pale spots on T2, and apparently T3 and 4 have pale markings beneath the heavy integument.

The female cited by Bradley simply from "Mexico", and the female from Teotihuacan in the state of Mexico, cited above, have the dark bands of the wings much wider so that the pale bands between them are very narrow, even obsolescent. These two specimens also have the pale pubescence of the body much reduced, the pleura and propodeum being mostly or wholly dark, the first tergite with only a narrow apical band of pale pubescence or none at all. Since this variation is in the direction of *portiae*, one wonders if there may



have been an introgression of *portiae* genes into the population at higher altitudes in central Mexico. Further study may reveal a zone of intergradation between these two forms.

Psorthaspis variegata variegata (Smith)

Ferreola variegata Smith, 1862, Jour. Ent., 1: 398-399 [Type: ♀, MEXICO (no further data) (BMNH, no. 19, 311)].

Pompilus confusaneus Cresson, 1869, Proc. Boston Soc. Nat. Hist., 12: 369 [Type: ♂, MEXICO: VERACRUZ: Orizaba (F. Sumichrast) (ANSP, no. 559)]. — Cameron, 1893, Biol. Centr.-Amer., Hymen. II, p. 201. New synonym.

Ferreola formosa Cresson, 1869, *ibid.*, p. 376 (Orizaba, Mexico; misidentification).

Pompilus pictus Kohl, 1886, Verh. K.K. Zool.-Bot. Ges. Wien, 36: 338 [Type: ♀, MEXICO: MORELOS: Cuernavaca (Bilimek) (? Vienna Mus.)]. — Cameron, 1893, *op. cit.*, p. 188. New synonym.

Pompilus variegatus Cameron, 1893, *ibid.*, p. 188.

Pedinaspis picta Schulz, 1911, Zool. Annalen, 4: 120.

Psorthaspis picta Bradley, 1944, Trans. Amer. Ent. Soc., 70: 68-69 (re-described).

Psorthaspis variegata Bradley, 1944, *ibid.*, p. 73 (listed as not recognized).

Dicyrtomalis confusanea Bradley, 1944, Notulae Nat., Acad. Nat. Sci. Phila., no. 145, p. 11.

Smith's description of *variegata* is exceedingly brief and inadequate, and it is little wonder that subsequent workers have failed to recognize his species. The type is in good condition except that some of the pubescence has been rubbed off. The synonymy of the two Cresson "male" species which Bradley placed in his genus *Dicyrtomalis* (*confusanea* and *connexa*) with the two most highly evolved "female" species of *Psorthaspis*, *variegata* and *bugabensis*, is admittedly no more than a guess, yet I have considerable confidence in this conclusion. These two males, which have unusually short antennae but are otherwise not dissimilar to the males of *formosa* and *portiae*, are unquestionably the males of two specialized, brightly colored *Psorthaspis*, and *variegata* and *bugabensis* are the only known females with which they might go. Reasons for specifically associating *connexa* with *bugabensis* (more particularly with the form described by Bradley as *bioculata*) are discussed under that species.

Description of type female. — Length 11 mm.; fore wing 9 mm. Color black, except second antennal segment and adjacent parts of first and third dark rufous, and T3 with a broad orange band, emarginate behind. Front, vertex, and temples with dense golden pubescence; pronotum with coarse black pubescence on front half, with dense golden pubescence behind, like the mesoscutum; scutellum, metanotum, and base of propodeum with black pubescence; greater part of propodeum and T1 with coarse, whitish pubescence; pleura, legs, abdominal venter and apical two tergites also with whitish pubescence.⁸ Fore wings with prominent banding which involves both the membrane and the rather coarse setulae; basal half of wing dark except for a milky-white band in the median and submedian cells, not reaching the anal cell; a second milky white to luteous band starts just basad of the stigma and barely reaches the hind margin of the wing; apical .4 of wing dark except for a narrow, subhyaline, preapical streak. Clypeus 1.4 X as broad as high, its apical margin weakly rounded. Clypeo-frontal bridge round-topped, not depressed below level of clypeus and front. MID .63 X TFD, .92 X height of eye; UID 1.15 X LID. POL:OOL = 13:19; distance from posterior ocelli to vertex crest subequal to POL; vertex slightly depressed laterad of posterior ocelli. First four antennal segments in a ratio of about 33:8:22:21, segment three 3 X as long as thick, .4 X UID. Vertex passing straight across a short distance above eye tops. Pronotum of moderate length, disc 1.5 X as wide as long; anterior part

⁸ Since the type is somewhat rubbed, the statements regarding pubescence are based in part on the other females available. In fresh specimens the pubescence of the head and pro- and mesonota is orange.

sloping weakly to collar, which is on a slightly lower plane than disc. Propodeum with a weak median impression and with strong transverse rugae on the sides; disc longitudinally humped on each side, behind the spiracles; declivity concave and without rugae in the center. Claws curved so that the outer ray is subparallel to the tooth, which is strong. Apex of abdomen only very weakly compressed.

Description of type male of confusaneus. — Length 9.5 mm.; fore wing 7.5 mm. Black, pubescence coarse, mostly silvery or somewhat milky, patterned with dark pubescence exactly as described for *formosa*; fore wing weakly clouded along basal vein, entire apical third also clouded; hind wing weakly clouded at tip. Head, thoracic dorsum, propleura, and front coxae with short, pale hairs, but body otherwise without erect setae. Clypeus 1.6 X as wide as high, its apical margin weakly convex. Head 1.10 X as wide as high; MID .66 X TFD; UID 1.3 X LID. POL and OOL subequal; vertex less strongly arched above eye tops than in *formosa*, very weakly humped in ocellar triangle; crest of vertex less sharp than in *connexa*. First four antennal segments in a ratio of about 15:5:7:8, segments three and four each about 1.15 X as long as wide, segments five through twelve each about 1.1 X as long as wide. Postero-lateral angles of propodeum prominent, but not forming vertical flanges as in *connexa*. Claws as in *formosa*. SGP strongly keeled, the keel arched in profile; when flattened out (fig. 65) the sides are seen to be angulate, much as in *portiae* and *formosa*. Genitalia (fig. 29) with the aedoeagus elongate, about as long as the parapenial lobes and digiti; outer mesal portion of digiti with a semicircular area devoid of setae.⁹

Distribution. — Southern Mexico to El Salvador. (Map 20.)

Specimens examined. — 5 ♀♀, 23 ♂♂. MEXICO: 2 ♀♀ (no further data) [BMNH]. [MORELOS: 1 ♀, Cuernavaca, type of *pictus* Kohl]. VERACRUZ: 1 ♀, 1 ♂, Orizaba (F. Sumichrast) [ANSP]; 1 ♀, 5 mi. W San Andres Tuxtla, 1000 feet elev., 5 July 1959 (B. & B. Valentine) [MCZ]. CHIAPAS: 1 ♀, 15 mi. NW Comitan, 3 Aug. 1952 (Gilbert & MacNeil) [CIS]; 1 ♂, Pichucalco, 9 Aug. 1962 (RFS) [CIS]. EL SALVADOR: 21 ♂♂, 31 mi. W Quezaltepeque, Aug. 1961, June 1963 (M. Irwin) [UCD].

Variation. — In all available females other than the type, the posterior ocelli are removed from the vertex crest by more than the length of POL (1.1-1.3 X POL). In the specimens from San Andres Tuxtla the black pubescence of the pronotum extends backward fairly close to the posterior margin medially, and in this specimen and that from Chiapas the antennae are wholly black. The El Sal-

⁹ The description of the terminalia is based on the El Salvador specimen, the genitalia of the type of *confusaneus* not having been extracted.

vador males vary considerably in size (LFW 5-8 mm.); MID varies from .65 to .69 X TFD; POL:OOL varies from 1:1 to 5:4; antennal segment four varies from 1.1 to 1.2 X as long as thick, segment eleven from 1.1 to 1.3 X as long as thick. In wing color and patterning of the pubescence these specimens are very similar to the type.

***Psorthaspis variegata impudica* (Cameron)**

Pompilus impudicus Cameron, 1893, Biol. Centr.-Amer., Hymen. II, p. 187 [Type: ♀, PANAMA: Peña Blanca, 3-4000 feet (GCC) (BMNH, no. 19, 314)].

Pedinaspis impudica Schulz, 1911, Zool. Annalen, 4: 119.

Psorthaspis canipennis Bradley, 1944, Trans. Amer. Ent. Soc., 70: 71-72 [Type: ♀, PANAMA: Alajuela, 28 May 1912 (A. Busck) (USNM, no. 57, 931)]. **New synonym.**

Psorthaspis impudica Bradley, 1944, *ibid.*, p. 72 (listed as not seen).

This form differs only slightly from *variegata* and is best considered a subspecies. Presumably the ranges of the two forms meet somewhere in Central America.

Description of type female. — Length 12 mm.; fore wing 9 mm. Black, second antennal segment and adjacent parts of first and third dull rufous, T3 with two large basal whitish spots which are narrowly separated medially. Head, entire pronotum, mesoscutum, and anterior half of scutellum with heavy orange pubescence which obscures the integument; face, clypeus, legs, lower pleura, propodeum except base and center of declivity, apical margin of first tergite, apical two tergites, and all sternites with somewhat finer whitish pubescence. Banding of wings as described for *v. variegata*. Front of moderate breadth, MID .60 X TFD, 0.90 X height of eye. All other features as described for *v. variegata*.

Male. — Unknown.

Distribution. — Panama; known only from the type specimens of *impudica* and *canipennis*, cited above. (Map 20.)

Variation. — The type of *canipennis* is slightly smaller than that of *impudica* (11 mm., fore wing 9) and the spots on the third tergite are not quite as large. Otherwise the two types are closely similar.

***Psorthaspis connexa connexa* (Cresson) new combination.**

Pompilus connexus Cresson, 1869, Proc. Boston Soc. Nat. Hist., 12: 369-370

- [Type: ♂, MEXICO: VERACRUZ: Orizaba (F. Sumichrast) (ANSP, no. 560)]. — Cameron, 1893, Biol. Centr.-Amer., Hymen. II, p. 201.
- Psorthaspis bioculata* Bradley, 1944, Trans. Amer. Ent. Soc., 70: 70-71 [Type: ♀, COSTA RICA (no further data) (USNM, no. 57, 930)]. New synonym.
- Dicyrtomalis connexa* Bradley, 1944, Notulae Nat., Acad. Nat. Sci. Phila., no. 145, p. 11.

I regard this species as the most highly evolved member of the genus not only because of the unusual color pattern of the female but also because of the unique conformation of the vertex and the anterior part of the pronotum. The male has unusually short antennae and the propodeum is strongly concave behind. The male is much smaller than the female, but this is no more than the end-product of a trend which is seen in most of the species of this genus in which the females are brightly colored. Evidence that *connexa* and *bioculata* represent one species is as follows: (1) both represent the most specialized species in their particular sex; (2) the vertex of the male is unusually sharply margined, suggesting the condition in the female; (3) a male from Panama closely resembling *connexa* was taken at the same place and nearly the same time as a series of *bugabensis*, here regarded a subspecies of what has been called *bioculata*.

Female. — Length 11-16 mm. Black, second antennal segments and adjacent parts of first and third dull rufous, T2 with a pair of large pale yellow to pale orange spots, T4 and base of 5 also of this color. Pubescence of vertex, upper temples, and entire pronotum pale yellow to light orange; pubescence of mesoscutum and central part of scutellum and metanotum blackish; face, thoracic pleura, legs, and propodeum largely covered with whitish pubescence. Fore wings nearly hyaline on basal .4, with a strong brown band at basal and transverse median veins and a second band across wing at marginal cell, these two bands connected by a bar which fills much of the first discoidal cell, remainder of wing hyaline; hind wing hyaline, with a faint pattern similar to that of front wing. Clypeus 1.35-1.40 X as wide as high, rather flat, apex weakly rounded. Clypeo-frontal bridge round-topped, on same plane as clypeus and front. Head very slightly wider than high; MID .60-.63 X TFD. POL and OOL subequal; distance from hind ocelli to vertex crest subequal to POL; vertex crest rather sharp, distinctly raised medially, behind this elevation with a short, flat surface which fits against a similar short, vertical surface separating the collar and disc of pronotum. Pronotal disc rather short for the genus, 1.6 X as broad as long. Propodeum with moderately strong transverse rugae behind, absent from the center of the declivity, which is slightly concave. Claws with tooth strong, erect, outer ray curved so as to be nearly parallel to tooth. Apex of abdomen not notably compressed.

Description of male type of connexa. — Length 7.5 mm.; fore wing 7 mm. Black; pubescence rather fine, silvery over much of body, grading into brownish on vertex, thoracic dorsum and upper pleura, base of propodeum, and broad apical bands on first two tergites. Wings hyaline except fore wing with a brownish band across basal and transverse median veins, broadened toward posterior margin and barely separated from a broad brownish band covering apical third of wing; hind wings weakly infuscated on apical half. Body without erect setae. Clypeus 1.6 X as wide as high, its apical margin convexly rounded. Antennae very short and compact, first four segments in a ratio of about 11:4:4:5, segment three 1.4 X as wide as long, segments 4-12 each slightly wider than long, the entire antenna only about 1.5 X TFD. Eyes diverging strongly above, UID 1.2 X LID; front convex in profile; vertex strongly raised above eye tops, somewhat humped in ocellar triangle, crest rather abrupt; POL:OOL = 5:4. Temples not at all developed; head slightly concave behind. Propodeum with its postero-lateral angles produced as vertical flanges, the declivity strongly concave between them. Claws strongly bifid, inner ray subtruncate, close to outer ray and slightly thicker than outer ray, except for inner claws of front tarsi, where the inner ray is short and rounded. Abdomen with first two segments large, the remaining segments more or less telescoped within them in resting position. [Terminalia not examined; presumably they are identical to those of *connexa bugabensis*.]

Distribution. — Costa Rica to southern Mexico. (Map 21.)

Specimens examined. — 3 ♀♀, 1 ♂. COSTA RICA: 1 ♀ (no further data) [USNM]. HONDURAS: 1 ♀, Rosario Mine, 5 April (M. Bates) [MCZ]. MEXICO: VERACRUZ: 1 ♂, Orizaba (F. Sumichrast) [ANSP]; 1 ♀, Orizaba, 12-22 Aug. 1961 (RRD) [MSU].

Psorthaspis connexa bugabensis (Cameron)

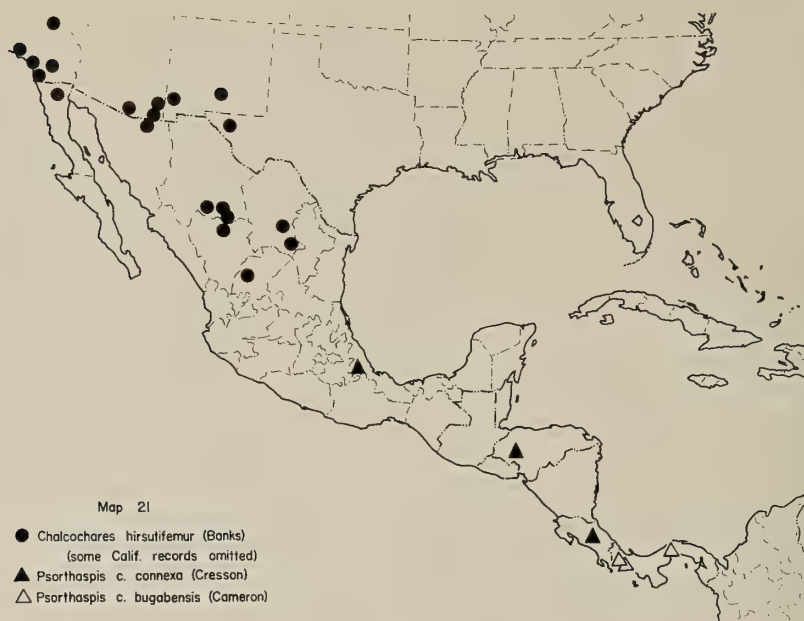
Pompilus bugabensis Cameron, 1893, Biol. Centr.-Amer., Hymen. II, p. 188 [Type: ♀, PANAMA: Bugaba, 800-1500 feet (GCC) (BMNH, no. 19, 315)].

Pedinaspis bugabensis Schulz, 1911, Zool. Annalen, 4: 119.

Psorthaspis bugabensis Bradley, 1944, Trans. Amer. Ent. Soc., 70: 72 (listed as not seen).

This form differs but slightly from the preceding, and it is questionable whether it deserves subspecific status.

Description of type female. — Length 15 mm.; fore wing 11.5 mm. Black; T2 with a pair of large, ivory-white spots, widely separated medially; T4 with a broad basal band of this same color. Vertex and pronotum (except posterior lateral portion) with dense orange pubescence which obscures the ground color;



remainder of pubescence, and also wing color, as described under *c. connexa*. Head 1.1 X as wide as high; MID .59 X TFD, .86 X eye height; UID .92 X LID. First four antennal segments in a ratio of about 18:6:13:13, segment three equal to .4 X UID. Fore wing with SMC3 wider below than second, but third intercubital vein arching such that this cell is narrower above than SMC2. All other features as described for *c. connexa*.

Male. — Length 6.5 mm.; fore wing 5 mm. Color of body and wings as in *c. connexa*; pubescence more extensively silvery than in that form, brownish only on vertex, greater part of thoracic dorsum, base of propodeum, and apical halves of first two tergites. Antennae even more compact than in *c. connexa*, segments 3-12 considerably wider than long. Eyes strongly diverging above, UID 1.32 X LID. SGP tectiform, moderately wide, rounded apically (fig. 66). Genitalia of typical *Psorthaspis* form; parameres abruptly truncate, short; digiti with a large area at the apex mesally which is devoid of setulae (fig. 30). Other features as in *c. connexa*.

Distribution. — Panama. (Map 21.)

Specimens examined. — 7 ♀♀, 1 ♂. PANAMA: 3 ♀♀, Bugaba (GCC) [BMNH]; 1 ♀, Volcan de Chiriqui, 2500-4000 feet (GCC) [BMNH]; 4 ♀♀, 1 ♂, Barro Colorado Island, Canal Zone, March-May 1956, 1963 (CWR) [KSU].

Variation. — The available females vary considerably in size

(fore wing 8.5-12 mm.). MID varies from .58 to .61 X TFD, UID from .92 to .97 X LID. In some specimens the pronotal pubescence is more golden than orange, but otherwise the coloration is very constant.

Genus **CHALCOCHARES** Banks

Chalcochares Banks, 1917, Bull. Mus. Comp. Zool., 61: 107 [Type species: *Psammochares hirsutifemur* Banks, monobasic; proposed as subgenus of *Psammochares*]. — Evans, 1950, Trans. Amer. Ent. Soc., 75: 153-159 (revision).

Anotochares Banks, 1939, Canad. Ent., 71: 225, 228 [Type species: *Anotochares engleharti* Banks, monobasic]. Synonymy by Evans, 1950.

Generic characters.—Size 10-30 mm.; wholly black, the pubescence bluish or violaceous, wings wholly fuscous; body strongly hairy, propodeum densely hairy, femora more or less hairy, abdomen of male densely hairy even dorsally. Mandibles of both sexes with two small teeth on inner margin, lower margin with a fimbriate groove. Clypeus transverse, not flattened, nearly as wide as lower front; labrum mostly concealed; malar space absent. Antennae elongate, segment three in female at least 3 X as long as thick, segment four in male at least nearly twice as long as thick. Front broad, vertex slightly to strongly elevated above eye tops. Pronotum moderately long, but the disc shorter than mesoscutum along the midline; sides of dorsum in female very prominent. Postnotum transversely linear. Propodeum relatively short and broad, abruptly declivous behind, sides of declivity rather prominent, slightly rugulose in females. Legs rather spinose; front tibiae of female with strong apical, somewhat curved spines, but front tarsus without a comb; apical tarsal segments spined beneath in female. Claws dentate throughout in both sexes, the front claws of the males alike, unmodified; pulvillar pad small, the comb with not over 12 setulae. Fore wing with three SMCs, the third much more narrowed above than the second; basal and transverse median veins interstitial or nearly so; hind wing unusually broad, the anal lobe large, at least three fourths the length of the submedian cell; anal vein strongly rounded below its junction with the median vein, often giving rise to a short stub vein at this point (fig. 8). Female with the abdomen stout, the apex without bristles but with a few setae; first tergite with the anterior surface nearly perpendicular to the dorsal. Abdomen of male showing weak constrictions between the basal segments; SGP tongue-shaped, with much shorter hairs than rest of abdomen. Genitalia with the parameres elongate, densely bristly along their lower inner margins; basal hooklets single; digiti slender; parapenial lobes stout, subtriangular in cross section, in lateral view very wide; aedoeagus slender, simple, somewhat folded longitudinally.

Distribution. — This genus is confined to the Sonoran subregion of the Nearctic region.

Included species. — Only the two considered below.

Remarks. — These wasps bear considerable resemblance to some of the less highly evolved, black species of *Psorthaspis*, and in some ways the genus appears annectant between that genus and the more typical Pompilinae. The resemblance to certain species of *Evagetes* is particularly striking. Yet *Chalcochaes* differs in several respects from both those genera. The large anal lobe of the hind wing is, so far as I know, unique in the Pompilidae.

Key to Species

Females

Vertex elevated far above eye tops, in anterior view nearly straight across and with a faint median impression; distance from posterior ocelli to top of vertex 1.4-2.0 X POL; head very slightly wider than high *engleharti* (Banks)
 Vertex elevated slightly and forming a more or less even arc above eye tops; distance from posterior ocelli to vertex crest 1.0-1.3 X POL; head 1.10-1.13 X as wide as high *hirsutifemur* (Banks)

Males

Vertex, seen in lateral view, forming a rather sharp crest considerably above and behind tops of eyes; parameres strongly curved, considerably longer than digiti *engleharti* (Banks)
 Vertex, in lateral view, rounded off a short distance above and behind eyes; parameres weakly to moderately curved, barely longer than digiti
 *hirsutifemur* (Banks)

Chalcochaes engleharti (Banks)

Anotochaes engleharti Banks, 1939, Canad. Ent., 71: 228 [Type: ♀, TEXAS, Fredericksburg, 10 Oct. 1939 (G. Englehart) (MCZ, no. 23, 481)].

Chalcochaes engleharti Evans, 1950, Trans. Amer. Ent. Soc., 75: 155-158, figs. 9, 15, 16 (Texas, Coahuila, Durango).

Although the females of the two species of *Chalcochaes* are so distinctive that Banks placed them in different genera, the males are much less easy to separate. The figures I presented in 1950 should be of assistance in this regard. I have seen no Mexican specimens of *engleharti* as large as most of those from Texas (a situation paralleling that in *Psorthaspis macronotum cressoni*).

Female. — Length 15-30 mm. Black, pubescence of body and fore wings reflecting dark bluish or violaceous. Head 1.02-1.06 X as wide as high, vertex strongly elevated as described in key; temples strongly developed, nearly or quite as wide as eyes, or even wider on upper half. Ocelli in a broad, flat triangle; POL:OOL about as 2:3. Hind tibiae with only one or two spines on the upper surface; apical tarsal segments with several spines beneath.

Male. — Length 10-23 mm. Color as in female; entire body very densely hairy, including the entire abdomen except for most of the first sternite. Clypeus rounded or subtruncate below. Head 1.02-1.05 X as wide as high. Vertex forming a strong arc well above tops of eyes, crest of vertex relatively abrupt; temples rather strong (see fig. 15 in Evans, 1950). SGP nearly parallel-sided for much of its length. Parameres of genitalia very strongly curved, considerably exceeding digiti.

Distribution. — This species occurs in arid and semiarid regions throughout northern Mexico east of the Sierra Madre Occidentale, also in Texas. Several Texas records were presented by Evans, 1950. (Map 20.)

Mexican specimens examined. — 40 ♀♀, 43 ♂♂. STATE OF MEXICO: 3 ♀♀, 7 ♂♂, Teotihuacán, 16 June, 7 July 1951 (HEE, PDH) [MCZ, CU, CIS]. HIDALGO: 6 ♀♀, 20 ♂♂, Zimapán, 11-14 June 1951 (HEE & PDH) [MCZ, CIS, USNM]. NUEVO LEON: 1 ♀, 1 ♂, 50 mi. SE Monterrey, 1700 feet, 12 Oct. 1957 (HAS) [OSU]. ZACATECAS: 1 ♀, 15 km. E Sombrerete, 28-31 July 1951 (PDH) [CIS]; 1 ♀, 9 mi. SE Fresnillo, 7-14 Aug. 1954 (JWM) [CIS]. DURANGO: 20 ♀♀, 4 ♂♂, 8 mi. S Canutillo, 9 Aug. 1951 (HEE & PDH) [MCZ, CIS, USNM, CU]; 1 ♀, San Isidro, Cuernavaca Dist., 6700 feet, 8 Aug. 1947 (CDM) [AMNH]; 3 ♂♂, San Juan del Rio, 7 Aug. 1951 (HEE) [MCZ]. CHIHUAHUA: 1 ♀, Santa Barbara, 6200 feet, 17 Aug. 1947 (G. M. Bradt) [AMNH]; 1 ♀, 1 ♂, 62 mi. S Hidalgo del Parral, 6200 feet, 24 Oct. 1957 (HAS) [OSU]; 2 ♂♂, 18 mi. W Jiménez, 11 Aug. 1951 (PDH) [CIS]; 5 ♀♀, 4 ♂♂, Chihuahua, 12 Aug. 1951 (HEE & PDH) [MCZ, CIS]. COAHUILA: 1 ♂, Buena Vista, 7000 feet, Sierra del Carmen, 12 July (R. H. Baker) [CIS].

***Chalcochares hirsutifemur* (Banks)**

Psammochares hirsutifemur Banks, 1914, Jour. N. Y. Ent. Soc., 22: 304 [Type:

♀, CALIFORNIA: Lemon Grove, 16 May (Van Duzee) (MCZ, no. 13, 691)].

Psammochares (*Chalcochares*) *hirsutifemur* Banks, 1917, Bull. Mus. Comp. Zool., 61: 107.

Chalcochares hirsutifemur Evans, 1950, Trans. Amer. Ent. Soc., 75: 158-159, figs. 10, 14, 17 (N. Mex., Ariz., Calif.). — Krombein, 1958, U. S. Dept. Agri. Monogr. 2, First Suppl., p. 180 (Texas).

Female. — Length 12-20 mm. Black, pubescence bluish or violaceous; wings fuscous, violaceous. Head relatively wider than in *engleharti*, measuring 1.10-1.14 X as wide as high, vertex forming an even arc above eye tops, posterior ocelli removed from crest of vertex by not much if any more than POL; temples moderately wide, narrowed above. POL:OOL about as 3:4. Apical tarsal segments weakly spined beneath.

Male. — Length 10-15 mm. Color as in female; body densely hairy, as in *engleharti*. Clypeus evenly rounded below. Head 1.07-1.11 X as wide as high; vertex rounding evenly between tops of eyes, its crest less abrupt than in *engleharti*; temples relatively narrow. SGP sides approaching gradually to a narrowly rounded apex. Genitalia with the parameres less strongly curved than in *engleharti*, also shorter, exceeding the digiti only slightly.

Distribution. — Zacatecas to California and to western Texas. Evans (1950) presented records from California, Arizona, and New Mexico. The Texas record in Krombein (1958) was based on 2 males collected by the writer in Hudspeth Co., western Texas, in August 1951. (Map 21.)

Mexican specimens examined. — 11 ♀♀, 3 ♂♂. ZACATECAS: 3 ♀♀, 15 km. E Sombrerete, 28-31 July 1951 (HEE) [MCZ]. DURANGO: 2 ♀♀, 8 mi. S Canutillo, 9 Aug. 1951 (HEE) [MCZ]. SONORA: 1 ♂, 10 mi. NE Cananea, 16 Aug. 1959 (Werner & Nutting) [UA]. BAJA CALIFORNIA: 1 ♀, 1 ♂, El Progreso, Sierra Juarez Mts., 10 Sept. 1958 (Truxal & Northern) [LACM]. CHIHUAHUA: 1 ♀, Agua Caliente, Santa Barbara Dist., 29 July 1947 (CDM) [AMNH]; 1 ♀, 1 ♂, 60-62 mi. S Hidalgo del Parral, 6280 feet, 24 Oct. 1957 (HAS) [OSU]; 1 ♀, 18 mi. W Jiménez, 10 Aug. 1951 (HEE) [MCZ]. COAHUILA: 1 ♀, 23 mi. E Saltillo, 4200 feet, 15 Oct. 1957 (HAS) [OSU]; 1 ♀, 17 mi. N Saltillo, 4800 feet, 16 Oct. 1957 (HAS) [OSU].

Genus EVAGETES Lepeletier

Evagetes Lepeletier, 1845, Hist. Nat. Ins. Hymen., 3: 390 [Type species: *Aporus bicolor* Lepeletier (= *dubius* Van der Linden), monobasic].

- Evans, 1950, Trans. Amer. Ent. Soc., 75: 159-189 (Nearctic spp.). — Evans, 1951, Trans. Amer. Ent. Soc., 77: 310-311.
- Sophropompilus* Howard, 1901, The Insect Book, pl. VII, fig. 13 [Type species: *Pompilus ingenuus* Cresson, monobasic]. — Ashmead, 1902, Canad. Ent., 34: 84. — Banks, 1947, Bull. Mus. Comp. Zool., 99: 429-432 (South American spp.). Synonymy by Evans, 1950.
- Nannopompilus* Ashmead, 1902, Canad. Ent., 34: 82 [Type species: *Nannopompilus argenteus* Ashmead (?=*argenteus* Cresson), monobasic]. Synonymy by Evans, 1950.
- Psammocharoides* Móczár, 1946, Ann. Hist. Nat. Mus. Natl. Hungar., 39: 114 [Type species: *Pompilus crassicornis* Shuckard, original designation]. Synonymy with *Sophropompilus* by Móczár, 1956.
- Streptosella* Dreisbach, 1950, Amer. Midl. Nat., 43: 570-574 [Type species: *Streptosella steyskali* Dreisbach (= *crassicornis crassicornis* Shuckard), designated by Evans, 1951]. Synonymy by Evans, 1951.

Generic characters. — Length 4-18 mm.; Mexican and Central American species entirely black, the pubescence (at least in the females) reflecting bluish or violaceous; body weakly to moderately hairy, in general much less so than in *Chalcochares*. Mandibles with a single tooth on the inner margin. Clypeus broad, but not wider than LID, its apical margin truncate; labrum mostly or wholly concealed; malar space present but very short. Antennae relatively short, in the female somewhat thickened and flattened, especially middle flagellar segments; third antennal segment of female not over 3.5 X as long as thick, never more than slightly longer than fourth and not over twice as long as thick, usually less. Front rather broad in most species; vertex extending only slightly above tops of eyes. Pronotum of moderate length, shorter than mesonotum, in Mexican and Central American forms always arcuate behind, at most with a weak angulation on the midline. Postnotum very small; propodeum without striae, in the female with an oblique declivity. Legs rather spinose, the female with a well developed comb on the front tarsus; apical tarsal segments of female with some median spines beneath. Last segment of front tarsus of male in most species slightly asymmetrical, the inner margin more or less produced, the claw on this side strongly curved, bifid; middle and hind tarsal claws, and all claws of female, dentate. Pulvillar comb weak, of at most about seven weak setulae arising from a small pad. Fore wing with three SMCs (only two in occasional specimens of *padrinus*, and in one extralimital species); SMC3 much narrowed above. Hind wing with the anal vein meeting the media at or slightly basad of the original of the cubitus; anal lobe less than half the length of the submedian cell. Abdomen of female without stout bristles apically. Male SGP tapering apically, midline weakly to strongly elevated (fig. 78). Genitalia with the parameres slender; digitus of variable shape, covered with short setae; basal hooklets single or weakly doubled; aedoeagus simple, often bearing minute setae (fig. 39).

Distribution. — This is chiefly a Holarctic genus, with several of the Nearctic forms extending into Central America at higher elevations. There are several South American species, occurring chiefly in the Cordilleras and apparently representing the most highly evolved elements of the genus.

Included species. — Five species occur in Mexico, and two of these extend into Central America; all five occur widely in the United States. Another species, *subangulatus* (Banks), has been taken in the mountains of southern Arizona and probably occurs in northern Mexico. I also take this opportunity to describe a new species from Southwestern United States which also probably enters Mexico.

Remarks. — The species of *Evagetes* are cleptoparasites of species of *Anoplius*, *Pompilus*, *Episyrus*, and probably other genera of typical Pompilinae. Recent European authors have not accepted my synonymy of *Sophropompilus* with *Evagetes*, chiefly because they tend to emphasize wing venation more than I do. The type species of *Evagetes* happens to have only two submarginal cells, but it is otherwise a typical member of this genus. On this continent, several genera and subgenera are now considered to contain some species with two submarginal cells and some with three (*Anoplius*, *Aporinellus*, *Perissopompilus*, *Hesperopompilus*).

Key to Species

Females

1. Front and hind wings wholly and uniformly deeply fuliginous; body without silvery pubescence, even on the front; submedian cell of hind wing usually broadly rounded apically, sometimes appendiculate *ingenuus* (Cresson)
- Wings not wholly and uniformly deep fuliginous; pubescence variable; submedian cell of hind wing usually more pointed or narrowly rounded apically 2
2. Front basitarsus with three short comb-spines, the apical one .5 to .8 as long as the second tarsal segment; pubescence dark bluish or violaceous, not usually silvery on the front *parvus* (Cresson)
- Front basitarsus with three or four comb-spines, the apical one more than .8 as long as the second tarsal segment 3
3. Front basitarsus with the comb-spines somewhat broad and flat, the apical one about as long as or somewhat longer than second tarsal segment;

- propodeum hairy in most specimens; SMC3 usually as wide below as second, or wider 4
- Front basitarsus with very long, slender comb-spines, the apical one usually distinctly longer than the second tarsal segment; propodeum not or but weakly hairy; SMC3 small, often triangular or nearly so 5
4. Vertex not at all humped at ocellar triangle; pubescence dull bluish-violet, not usually silvery on clypeus and front *asignus* Dreisbach
- Vertex weakly humped at the ocellar triangle; pubescence a more brilliant bluish or blue-green, silvery on clypeus and lower front *mohave* (Banks)
5. Front basitarsus with four comb-spines; size larger, 9-11 mm; propodeum strongly convex in profile, with a strong posterior declivity, sides slightly hairy *calefactus* new species
- Front basitarsus with three comb-spines; size 4-9 mm.; propodeum less convex in profile, the declivity less well defined; propodeum usually wholly without erect hairs 6
6. Body brilliantly bluish or blue-green; head and thorax often with a limited amount of silvery pubescence, the abdominal dorsum never silvery *padrinus padrinus* (Viereck)
- General appearance paler, the silvery pubescence very extensive, involving most of the head and thorax and part or all of the abdomen *padrinus minusculus* (Banks)

Males

1. SGP with the median line weakly elevated; SMC3 variable, at least slightly wider than high, not petiolate 2
- SGP with the median line elevated in the form of a strong ridge which is arcuate in profile; SMC3 small, more or less triangular, sometimes petiolate (rarely absent) 6
2. Front and hind wings wholly and almost uniformly deep fuliginous; third antennal segment about twice the length of the second *ingenuus* (Cresson)
- Wings not wholly and almost uniformly fuliginous; third antennal segment less than twice as long as second 3
3. Apical segment of front tarsus symmetrical, with no more than a very faint indication of a lobe on the inner side; SGP without a pair of sclerotized points near the base, or these very weakly developed 4
- Apical segment of front tarsus asymmetrical, with a distinct lobe on the inner margin; SGP with a pair of sclerotized, pigmented points near the base 5
4. Third antennal segment 1.2-1.4 X as long as thick; digiti rather slender apically and with a rather well developed portion which is directed mesad *asignus* Dreisbach
- Third antennal segment 1.6-1.8 X as long as thick; digiti broader apically

and only slightly produced mesad, the parameres also shorter than above

..... *calefactus* n. sp.

5. Vertex not humped at ocellar triangle, forming a nearly smooth arc; propodeum rarely more than weakly hairy; genitalia with digiti tending to be shorter apically and somewhat more sparsely setose than below

..... *parvus* (Cresson)

Vertex somewhat humped at the ocellar triangle; propodeum usually with a number of black setae extending above the coarse, silvery pubescence; pubescence brilliantly patterned with bluish and silvery

..... *mohave* (Banks)

6. Body often extensively silvery-sericeous, but reflecting bluish at least on the thoracic dorsum and part of the abdomen

..... *padrinus padrinus* (Viereck)

Body almost entirely silvery, a small part of the dorsum and abdomen brownish or brownish-violaceous, but not distinctly bluish

..... *padrinus minusculus* (Banks)

Evagetes ingenuus (Cresson)

Pompilus ingenuus Cresson, 1867, Trans. Amer. Ent. Soc., 1: 89 [Lectotype: ♀, DAKOTA TERRITORY (ANSP, no. 419)].

Pompilus brevicornis Taschenberg, 1869, Zeitschr. Ges. Naturw., 34: 50 [Type: ♂, "ILLINOIS" (Zool. Inst., Halle, Germany)]. Preoccupied by Cresson, 1867. — Cameron, 1893, Biol. Centr.-Amer., Hymen, II, p. 199. Synonym by Evans, 1963, Proc. Ent. Soc. Wash., 65: 108.

Pompilus florentinii Dalla Torre, 1897, Catal. Hymen, VIII, p. 289 (new name for *brevicornis* Taschenberg, nec Cresson).

Sophropompilus ingenuus Howard, 1910, The Insect Book, pl. VII, fig. 13. — Ashmead, 1902, Canad. Ent., 34: 84.

Psammochares (*Sophropompilus*) *ingenuus* Banks, 1912, Jour. N. Y. Ent. Soc., 19: 224. — Banks, 1917, Bull. Mus. Comp. Zool., 61: 107.

Evagetes ingenuus Evans, 1950, Trans. Amer. Ent. Soc., 75: 168-170 (Georgia and Calif. to Br. Col. and Quebec).

Taschenberg's *brevicornis* was described from a male from Illinois (a male *ingenuus* Cresson) and a female from Mexico (a female *azureus* Cresson). I have recently had an opportunity to examine these specimens, both of which are in good condition. The male is clearly marked as the type.

Female. — Length 10.5-18 mm. Black, rendered by the pubescence a deep blue or violaceous; pubescence nowhere silvery, even on the lower front; wings wholly and uniformly fuliginous, violaceous. Front very broad, MID .62-.66 X TFD; front rather strong'y convex; UID .85-.95 X LID. Ocelli forming an obtuse angle in front, POL:OOL about as 3:4. Antennal segment

three about twice as long as its greatest thickness, equal to only .35-.45 X UID. Propodeum with a well-defined declivity, with numerous erect hairs. Front basitarsus with three (rarely four) comb-spines, the apical one usually slightly shorter than second tarsal segment. Hind wing with submedian cell rather broadly rounded apically and sometimes appendiculate.

Male. — Length 10-17 mm. Color as in female; wings wholly fuliginous; body wholly without silvery pubescence. Scape hairy, front rather densely hairy, propodeum with numerous erect hairs. Front broad, MID .61-.66 X TFD; UID subequal to or very slightly exceeding LID. Ocelli in a broad, flat triangle, POL slightly less than OOL. First four antennal segments in a ratio of about 30:10:22:28, segment two relatively shorter than in other species of this genus, segment three only slightly less than twice as long as thick (see fig. 29 in Evans, 1950). Last segment of front tarsus distinctly asymmetrical. Hind wing as in female. SGP as in the following species. Genitalia with the basal hooklets double; aedoeagus bearing rather numerous small setae; parameres relatively long and slender; apical, mesally-directed portion of digiti moderately strong (see fig. 19 in Evans, 1950).

Distribution. — This relatively large and distinctive *Evagetes* is not well represented in most collections, although it occurs throughout all of the United States, except in the Lower Austral Zone, as well as across the entire length of southern Canada. Doubtless it occurs throughout the Mexican Central plateau, but so far it has been taken only in Chihuahua and the state of Mexico. (Map 23.)

Mexican specimens examined. — 2 ♀♀, 5 ♂♂. CHIHUAHUA: 1 ♂, Summit NE San José Babicora, 7700 feet, 4 July 1947 (CDM) [AMNH]. MEXICO: 2 ♀♀, 4 ♂♂, Teotihuacán, about 7500 feet, June, July (HEE, PDH, RRD) [MCZ, CIS, MSU].

Evagetes parvus (Cresson)

Pompilus parvus Cresson, 1865, Proc. Ent. Soc. Phila., 4: 453 [Type: ♀, COLORADO (ANSP, no. 549)]. — Cresson, 1867, Trans. Amer. Ent. Soc., 1: 91.

Pompilus subviolaceus Cresson, 1867, *ibid.*, p. 91 [Lectotype: ♀, DELAWARE (ANSP, no. 551)].

Pompilus argenteus Cresson, 1867, *ibid.*, p. 93 [Type: ♂, VIRGINIA (ANSP, no. 556)].

Pompiloides minora Banks, 1912, Jour. N. Y. Ent. Soc., 19: 227 [Type: ♀, VIRGINIA: Falls Church, 2 Aug. (NB) (MCZ, no. 13, 671)].

Sophropompilus parvus Banks, 1919, Bull. Mus. Comp. Zool., 63: 237.

Evagetes parvus Evans, 1950, Trans. Amer. Ent. Soc., 75: 170-174.

A more complete synonymy for this widely distributed species is

provided by Evans, 1950. In many ways this form suggests a diminutive *ingenuus*, but constant differences in the male antennae and minor differences in the genitalia indicate that the two are distinct species.

Female. — Length 5-11.5 mm. Black, pubescence deep bluish or violaceous, usually entirely so, but some specimens with silvery pubescence on the front, rarely on parts of the thorax. Fore wings lightly to moderately infuscated, darker apically; hind wings subhyaline or lightly infuscated. Propodeum barely to moderately hairy. Front broad, MID .62-.70 X TFD; UID approximately .9 LID; POL subequal to or slightly less than OOL. Third antennal segment approximately twice as long as its maximum width, measuring from .33 to .45 X UID. Pronotum arcuate behind; propodeum with an oblique declivity. Front basitarsus with three slender comb-spines, the apical one equal to .5-.8 the length of the second tarsal segment. Fore wing with SMC3 as wide below as second, or wider, much narrowed above, often subtriangular; hind wing with submedian cell more acute apically than in *ingenuus*.

Male. — Length 4-8 mm. Black, body with a very variable amount of silvery pubescence, some specimens with extensive bluish pubescence or even wholly bluish, others with hardly a trace of bluish. Wings subhyaline, fore wings with a fuscous band on the outer margin. Propodeum without erect hairs or with a very few (rarely with numerous dark setae). Front broad, MID .62-.67 X TFD; UID slightly exceeding LID; POL subequal to or somewhat greater or less than OOL. First four antennal segments in a ratio of about 25:10:15:18, segment three only 1.1-1.3 X as long as thick. Apical segment of front tarsus asymmetrical. Venation as in female. SGP weakly elevated medially, without a basal swelling, with a pair of weak basal sclerotized points (see Evans, 1950, fig. 33). Genitalia similar to those of *ingenuus* but the parameres shorter, the digiti rather weakly produced mesad apically and relatively sparsely setose (Evans, 1950, fig. 20).

Distribution. — This species inhabits the Upper Austral to the Canadian life zones of North America, from Yukon, Northwest Territories, and Nova Scotia south to Georgia and, at moderate to high elevations, to Costa Rica. (Map 22.)

Mexican and Central American specimens examined. — 47 ♀♀, 23 ♂♂. MEXICO: CHIHUAHUA: 1 ♀, Summit NE San José Babicora, 7700 feet, 4 July 1947 (WG) [AMNH]; 1 ♀, Santa Clara, 2 July 1947 (WG) [AMNH]. ZACATECAS: 1 ♀, 2 ♂♂, 15 km. E Sombrerete, 28-31 July 1951 (HEE & PDH) [MCZ, CIS]. JALISCO: 1 ♀, Villa Guadalupe, 26 July 1951 (HEE) [MCZ]. GUERRERO: 1 ♀, Omilteme, July, 8000 feet (HHS) [BMNH]; 1 ♀, 7 mi. S Manizintla, 1 Dec. 1948 (ESR) [CAS]. MORELOS: 12 ♀♀, 3 ♂♂, Cuernavaca, Mch.-May 1959 (HEE) [CU, MCZ]; 15 ♀♀, 3 ♂♂,



3-4 mi. NW Cuernavaca, 6500-7500 feet, Mch.-June 1959 (HEE) [CU, MCZ]; 1 ♂, Canyon de Lobos, nr. Yautepec, 4000 feet, 13 March 1959 (HEE) [MCZ]. DISTRITO FEDERAL: 1 ♀, Puerto de las Cruces, 10,000 feet, 1 Aug. 1962 (HEE) [MCZ]. MEXICO: 4 ♀ ♀, 9 ♂ ♂, Teotihuacán, 7500 feet, June, July (HEE, PDH, RRD) [MCZ, CIS, MSU]; 1 ♀, Valle de Bravo, 6500 feet, 3 Aug. 1962 (HEE) [MCZ]; 2 ♂ ♂, 34 km. W Toluca, 8500 feet, 9 Aug. 1962 (HEE) [MCZ]. PUEBLA: 1 ♂, 14 mi. W Huauchinango, 17 June 1951 (PDH) [CIS]. VERACRUZ: 1 ♀, Orizaba, Oct. 1923 (E. G. Smyth) [USNM]. CHIAPAS: 1 ♀, 1 ♂, San Cristobal las Casas, April, Sept., 7500 feet (HEE, FPM) [MCZ, ENAC]; 1 ♀, 20 mi. W San Cristobal, 3 May 1959, 6000 feet (HEE) [MCZ]. GUATEMALA: 1 ♀, Antigua, 15 Aug. 1952 (RHP) [MCZ]; 2 ♀ ♀, no further data [MCZ]. EL SALVADOR: 1 ♀, Cerro Verde, June 1963 (M. Irwin) [UCD]. COSTA RICA: 1 ♀, Zarzero (Bargdorf) [USNM]; 1 ♂, Corralillo, Irazu, Jan. 1924 (F. Tristan) [ANSP].

Evagetus asignus Dreisbach

Evagetus asignus Dreisbach, 1956, Ent. News, 67: 147-151 [Type: ♂, NORTH CAROLINA: Kill Devil Hills, 3 Aug. 1952 (K. V. Krombein) (USNM,

no. 63, 098)]. — Krombein, 1958, U. S. Dept. Agri. Monogr. 2, First Suppl., p. 180.

Female. — Length 7-13 mm. Black, pubescence dark bluish-violaceous or somewhat purplish, sometimes somewhat cinereous or silvery on the lower front (but not in the known Mexican specimens). Fore wing lightly infuscated, with a darker band on the outer margin; hind wings subhyaline. Front with numerous short setae; propodeum with a moderate number of longer, black setae. MID .62-.65 X TFD; UID .90-1.0 X LID; POL and OOL subequal, or either may be slightly greater. Third antennal segment 1.8-2.0 X as long as thick, measuring .35-.42 X UID. Vertex arching smoothly between eye tops, not humped at ocelli. Propodeum with a steep, oblique declivity. Front basitarsus with four somewhat flattened comb-spines (rarely three or five), the apical one subequal in length to the second tarsal segment. Wings as in the preceding species.

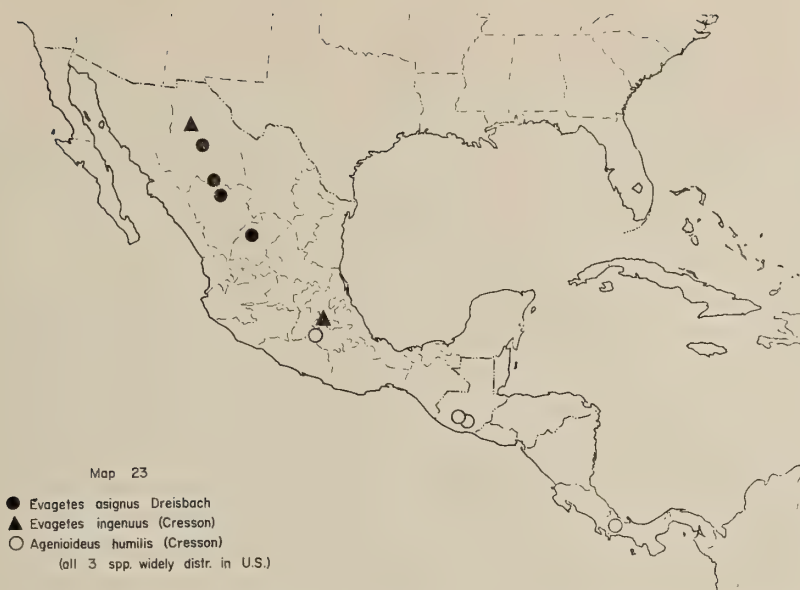
Male. — Length 5-10 mm. Black, pubescence silvery at least on the front and the propodeum, often more extensively so, even almost wholly silvery; pubescence, where not silvery, varying from bluish to brownish-violaceous. Wings subhyaline, outer margin of fore wing with a darker band. Propodeum with a few dark setae which extend above the silvery pubescence. Front of moderate breadth, MID .60-.65 X TFD; UID 1.1-1.2 X LID; POL and OOL subequal, or either may be slightly the greater. Antennal segment three 1.2-1.4 X as long as thick, 1.3-1.6 X as long as two, distinctly shorter than four. Apical segment of front tarsus not asymmetrical. SGP weakly elevated medially, with paired sclerotized points at its base very weakly if at all developed (see fig. 1 in Dreisbach, 1956). Genitalia characterized by unusually slender parameres and by having the apical portion of the digiti strongly produced mesad (see fig. 2 in Dreisbach, 1956).

Distribution. — This species occurs throughout eastern United States, ranging as far north as Alberta, Michigan, and Massachusetts. It is not uncommon in western Texas, and ranges south on the Mexican central plateau at least into Zacatecas. (Map 23.)

Mexican specimens examined. — 4 ♀♀, 1 ♂. CHIHUAHUA: 1 ♀, 70 mi. S Hidalgo del Parral, 6500 feet, 24 Oct. 1957 (HAS) [OSU]; 1 ♀, 24 mi. SW Chihuahua, 6 Sept. 1962 (RHP) [MCZ]. DURANGO: 1 ♂, 8 mi. S Canutillo, 9 Aug. 1951 (HEE) [MCZ]. ZACATECAS: 2 ♀♀, 15 km. E Sombrerete, 28-31 July 1951 (HEE & PDH) [CIS, MCZ].

Evagetes mohave (Banks)

Sophropompilus quadrispinosus Banks, 1919, Canad. Ent., 51: 82 [Type: ♀, NEW YORK: Long Beach, L. I., Aug. (Shannon) (MCZ, no. 13, 703)]. Preoccupied in *Evagetes* by Klug, 1886.



Sophropompilus mohave Banks, 1933, *Psyche*, 40: 6 [Type: ♀, ARIZONA: Tempe, Aug. (JB) (MCZ, no. 17, 034)]. Erroneously placed in synonymy with *hyacinthinus* by Evans, 1950.

Evagetes mohave Krombein, 1953, *Wasmann Jour. Biol.*, 10: 320-323. — Krombein, 1958, U. S. Dept. Agri. Monogr. 2, First Suppl., p. 180.

Krombein (1953) has redescribed this species and presented characters for separating it from *hyacinthinus* and *asignus*.

Female. — Length 8-13 mm. Black, pubescence brilliant bluish, blue-green, or somewhat violaceous, silvery on the clypeus and lower part of the front. Fore wing moderately to rather heavily infuscated, with a darker band on the outer margin; hind wing subhyaline, darker at tip. Head and thorax with sparse, short hair; front femora somewhat hairy; propodeum always with numerous erect hairs. MID .60-.67 X TFD; UID .89-.98 X LID. POL and OOL subequal, or OOL slightly the greater, ocellar region somewhat humped. Third antennal segment about twice as long as its maximum width, from .33 to .42 X UID. Propodeum with an oblique declivity. Front basitarsus with four somewhat flattened, pale-tipped comb-spines, the apical one subequal in length to the second tarsal segment. SMC3 much narrowed above, but never triangular.

Male. — Length 5-9 mm. Black, pubescence as in female except silvery not only on front and clypeus, but also on sides of scutellum, metanotum, and

posterior part of propodeum, sometimes much more extensively than this. Propodeum with at least at few setae extending above the pubescence. MID .61-.66 X TFD; UID 1.07-1.20 X LID; POL and OOL subequal, or either may be slightly the greater; vertex slightly humped at the ocellar triangle, as in the female. Antennal segment three 1.2-1.3 X as long as thick, 1.3-1.4 X as long as two, much shorter than four. Apical segment of front tarsus weakly lobed on inner margin, therefore asymmetrical. SGP as in *parvus*, with a pair of sclerotized basal points. Parameres less slender than in *asignus* and the digiti less produced mesad apically and somewhat more sparsely setose.

Distribution. — This species occurs transcontinentally in southern United States, in the East as far north as Long Island. All Mexican records thus far are from the western part, chiefly at lower elevations than *parvus*. I have seen no specimens from south of the Isthmus of Tehuantepec, but females from Bolivia and Argentina assigned by Banks (1947, Bull. Mus. Comp. Zool., 99: 432) to *coeruleus* Taschenberg are strikingly similar to *mohave* and may be conspecific. (Map 24.)

Mexican specimens examined. — 19 ♀♀, 11 ♂♂. CHIHUAHUA: 1 ♀, 82 mi. S Juarez, 4000 feet, 15 Aug. 1957 (HAS) [OSU]; 1 ♂, Matlachic, 7 July 1947 (CDM) [AMNH]. SONORA: 1 ♀, Sonoyta, 4 April 1949, 1500 feet (G. M. Bradt) [AMNH]; 1 ♂, Cocorit, 11 June 1961 (FDP) [UCD]. BAJA CALIFORNIA: 1 ♂, Descanso, 1 Sept. 1955 (RMB) [UCD]; 1 ♂, Punta Lobos, 1 mi. SE Todos Santos, 25 Dec. 1959 (HBL) [CAS]; 1 ♀, La Paz, June [CAS]. SINALOA: 1 ♀, Mazatlan, 15 Aug. 1962 (HEE) [MCZ]; 2 ♀♀, 2 ♂♂, 8 mi. SE Elota, 18 May 1962 (FDP) [UCD]. NAYARIT: 4 ♂♂, San Blas, 20 July 1951 (HEE & PDH) [MCZ], [CIS]. JALISCO: 2 ♀♀, Guadalajara, July, Aug. (HEE, RRD) [MCZ, MSU]; 1 ♀, Lake Chapala, 7 July 1953 (C. & P. Vaurie) [AMNH]. PUEBLA: 1 ♀, 3 mi. NW Petlalcingo, 3 Apr. 1962 (FDP) [UCD]. MORELOS: 4 ♀♀, 1 ♂, Cuernavaca, Mch.-May 1959, 4500-5500 feet (HEE) [CU, MCZ]; 1 ♀, 3 mi. N Alpuyeca, 3400 feet, 18 April 1959 (HEE) [MCZ]; 3 ♀♀, Tetecala, 2800 feet, 10 Aug. 1962 (HEE) [MCZ]. GUERRERO: 1 ♀, Canyon de Zopilote, 2000 feet, 30 July 1962 (HEE) [MCZ].

Evagetes padrinus padrinus (Viereck)

Anoplius (Pompilinus) padrinus Viereck, 1902, Proc. Acad. Nat. Sci. Phila.,



54: 734 [Type: ♂, CALIFORNIA: San Pedro, 27 July (Cockerell) (ANSP, no. 563)].

Pompiloides (*Nanopompilus*) *padrinus* Banks, 1914, Jour. N. Y. Ent. Soc., 22: 301.

Evagetes padrinus padrinus Evans, 1950, Trans. Amer. Ent. Soc., 75: 174-176.

Female. — Length 4-9 mm. Black, rendered by the pubescence brilliant bluish, blue-green, or violaceous; pubescence silvery on clypeus and lower front, often also on parts of the thorax, propodeum, and legs, but dorsum of thorax and abdomen never silvery. Wings subhyaline or lightly infuscated, fore wing with a dark apical band. Body with only a few inconspicuous hairs on the head and prothorax; propodeum with at most a very few weak hairs on the sides. Front narrow for the genus, MID .59 to .64 X TFD; UID about .9 X LID; POL and OOL subequal in most specimens. Third antennal segment 2.0-2.5 X as long as thick, .45-.55 X UID. Slope of propodeum somewhat lower than in related species, the declivity less well defined. Front basitarsus with three very slender comb-spines, the apical one as long as or (more commonly) longer than second tarsal segment. Fore wing with marginal cell 1.3-2.0 X its own length from wing tip; SMC3 small, much narrowed above by arcuation of third transverse cubital vein, usually triangular, occasionally petiolate (rarely absent). Submedian cell of hind wing somewhat pointed apically.

Male. — Length 3.5-7 mm. Black, pubescence bluish at least on parts of the thoracic dorsum and abdomen, in greater part silvery; wings subhyaline or lightly infuscated, fore wing with a dark marginal band. Body without erect

setae except for some inconspicuous ones on the head and prothorax. MID .59-.63 X TFD; POL and OOL subequal in most specimens. Third antennal segment 1.5-1.8 X as long as thick, about 1.5 X as long as second, slightly shorter than fourth. Apical segment of front tarsus very slightly asymmetrical. Venation as in female. SGP with a high median ridge which is arched in profile (see fig. 28 in Evans, 1950). Genitalia with the digiti much expanded, subtriangular; aedoeagus with some weak setae (fig. 24 in Evans, 1950).

Distribution. — British Columbia and Manitoba south to Baja California and, at moderate to high elevations, to El Salvador. In the eastern half of North America, including northeastern Mexico, it is replaced by subspecies *minusculus*. (Map 25.)

Mexican and Central American specimens examined. — 42 ♀♀, 25 ♂♂. MEXICO: BAJA CALIFORNIA: 1 ♀, Sierra San Pedro Martir, La Encantada, 7000 feet, 30 May 1958 (JP) [CIS]. SINALOA: 1 ♀, 6 mi. E Potrerillos, 18 Mch. 1962 (FDP) [UCD]. DURANGO: 6 ♀♀, 1 ♂, El Salto & vic. May, Aug. (HEE, PDH, FDP) [MCZ, CIS, UCD]; 1 ♀, Nombre de Dios, 6 Aug. 1951 (HEE) [MCZ]. ZACATECAS: 1 ♀, 15 km. E Sombrerete, 28-31 July 1951 (PDH) [CIS]. NAYARIT: 1 ♀, Tepic, Sept. 1953 (B. Malkin) [CAS]. MORELOS: 2 ♀♀, 2 ♂♂, 3 mi. N Alpuyeca, Mch.-May 1959 (HEE) [CU, MCZ]; 5 ♀♀, 9 ♂♂, Cuernavaca & vicinity, 4500-7500 feet, Mch.-July (HEE, RRD) [CU, MCZ, MSU]; 5 ♀♀, 2 ♂♂, 9 mi. N Cuernavaca, 8500 feet, 26-27 June 1951, 59 (HEE) [CU, MCZ]. MEXICO: 4 ♀♀, Agua Bendita, 9700 feet, 2 Aug. 1962 (HEE) [MCZ, ENAC]; 1 ♀, Valle de Bravo, 6500 feet, 3 Aug. 1962 (HEE) [MCZ]; 1 ♂, W Slope Popocatepetl, 9500 feet, 5 July 1951 (HEE) [MCZ]; 4 ♀♀, 4 ♂♂, Teotihuacán, July 7500 feet (HEE, RRD) [MCZ, CU, MSU]. DISTRITO FEDERAL: 3 ♀♀, Puerto de las Cruces, 10,000 feet, 1 Aug. 1962 (HEE) [MCZ, ENAC]; 1 ♀, Topilejo, 16 May 1959, 9000 feet (HEE) [MCZ]. PUEBLA: 2 ♀♀, 2 ♂♂, 14 mi. W Huauchinango, 17 June 1951 (HEE, PDH) [MCZ, CIS]. CHIAPAS: 3 ♂♂, San Cristobal las Casas, 25 Apr.-1 May 1959 (HEE) [CU, MCZ]. GUATEMALA: 1 ♀, Antigua, 15 Aug. 1952 (RHP) [MCZ]; 1 ♀, Cristobal Tonicoban, 16 Aug. 1952 (RHP) [MCZ]; 1 ♀, Lake Atitlan, 15 Aug. 1951 (RHP) [MCZ]. EL SALVADOR: 1 ♀, Los Chorros, 20 June 1963 (M. Irwin) [UCD]; 1 ♂, Quezaltepeque, 3 July 1963 (M. Irwin) [UCD].

Variation. — Of the 67 Mexican and Central American speci-



mens examined, one male has only two SMCs on both wings, and two females have two on one side and one on the other. In about 20% of the specimens SMC3 is petiolate.

Evagetes padrinus minusculus (Banks)

Psammochares minusculus Banks, 1910, Jour. N. Y. Ent. Soc., 18: 118 [Type: ♀, TEXAS: Fedor, Lee Co., 21 June 1909 (G. Birkman) (MCZ, no. 13, 701)].

Pompiloides (Nanopompilos) minusculus Banks, 1914, Jour. N. Y. Ent. Soc., 22: 301.

Evagetes padrinus minusculus Evans, 1950, Trans. Amer. Ent. Soc., 75: 176-177.

Female. — Length 4-9 mm. Differs from *p. padrinus* only being much more extensively silvery-sericeous, sometimes almost wholly so, at most bluish on parts of the thoracic dorsum and abdomen.

Male. — Length 4-6.5 mm. Pubescence over most of head and thorax silvery, rather coarse; first three or four abdominal tergites with basal silvery fasciae; pubescence of vertex and parts of the thoracic dorsum and abdomen brownish-violaceous, at most obscurely bluish.

Distribution. — Florida and northeastern Mexico to the Dakotas, Ontario, and New Hampshire. (Map 25.)

Mexican specimens examined. — 2 ♀♀. TAMAULIPAS: 1 ♀, Rio Guayalejo at Highway 85, 3 Aug. 1959 (AM & LS) [UCD]. COAHUILA: 1 ♀, 12 mi. N Hermanas, 11 Aug. 1959 (AM & LS) [UCD].

Evagetes calefactus new species

Holotype. — ♀, CALIFORNIA: San Diego Co., Agua Caliente Creek, Warner Springs, 25 Aug. 1962 (HEE) [MCZ, no. 30, 962].

Description of type female. — Length 11 mm.; fore wing 9.5 mm. Black; pubescence wholly dark, with strong bluish and blue-green reflections; fore wing moderately infuscated except lightly infuscated at extreme base, heavily infuscated in a broad outer marginal band; hind wing lightly infuscated, darker apically. Scape not hairy; front, vertex, and front coxae weakly hairy; temples and propleura with abundant fine hair; propodeum with fairly numerous but very short, fine hairs on the sides of the declivity; abdomen very smooth, with only a few weak hairs ventrally and apically. Labrum slightly exserted beyond the rather small clypeus, which is truncate apically, 2.3 X as wide as high. Head 1.18 X as wide as high; front very narrow for the genus, MID .55 X TFD; UID .97 X LID, the inner margins of the eyes subparallel; front with a fine median linear impression. Ocelli in a broad, flat triangle, POL:OOL = 5:4. First four antennal segments in a ratio of about 25:8:33:27, third segment about 3.5 X as long as its maximum width, equal to .72 X UID. Temples not at all developed; vertex weakly arched above the eye tops, not at all elevated at the ocellar triangle. Pronotum evenly arcuate behind. Propodeum with a strong, linear median impression; declivity strongly defined. Front tarsus with a comb of very long, slender spines, four on the basitarsus, the apical one about 1.3 X as long as the second tarsal segment. Fore wing with SMC2 about 1.8 X as wide as high, SMC3 about 1.2 X as wide as high, narrowed by nearly .9 above.

Allotype. — ♂, same data as type [MCZ].

Description of allotype male. — Length 6 mm.; fore wing 5 mm. Black; pubescence reflecting bluish as in the female, except silvery on the clypeus, front, sides of the scutellum, metanotum, and posterior slope of the propodeum; wings hyaline, fore wing with a broad dark band along the outer margin, hind wing slightly infuscated at tip. Head, propleura, and front coxae weakly setose; propodeum with a few hairs on each side which stand well above the coarse pubescence. Clypeus rather strongly convex, about twice as broad as high; front broad, MID .65 X TFD; eyes diverging strongly above, UID 1.15 X LID. Ocelli in a broad triangle; POL:OOL = 5:4; vertex very weakly elevated within the ocellar triangle. First four antennal segments in a ratio of about 13:5:8:9, segment three about 1.6 X as long as wide. Pronotum rather long,

its posterior margin very indistinctly angulate medially. Propodeum impressed medially, strongly declivous on the posterior third. Last segment of front tarsus barely asymmetrical; inner claw of this tarsus strongly curved, bifid. Longer spur of hind tibia .67 X as long as the basitarsus. Fore wing with SMC2 1.7 X as wide as high, SMC3 very much smaller, subtriangular, only very slightly wider than high. SGP moderately elevated medially, without a pair of sclerotized points toward the base (fig. 78). Genitalia with relatively short parameres and with the digiti relatively broad and but little produced toward the midline, in general very similar to those of *parvus*; aedoeagus with a number of setae on the apical fifth (fig. 39).

Paratypes. — TEXAS: 1 ♀, Seguin, 7 June 1960 (J. E. Gillaspay) [USNM]. ARIZONA: 1 ♂, 3 mi. SE Fredonia, 21 Aug. 1957 (W. F. Barr) [USNM]. MONTANA: 1 ♀, no further data [ANSP].

Variation. — The two female paratypes are 9.5 (Texas) and 10 (Montana) mm. in length. Both specimens have a large amount of silvery pubescence on the clypeus, front, and temples, but otherwise they are strikingly like the type. In the Texas specimen MID is .56 X TFD, antennal segment three .68 X UID. The Montana specimen has a somewhat broader front and vertex, MID measuring .60 X TFD, antennal segment three .65 X UID. In both paratypes the apical basitarsal comb-spine is about 1.5 X as long as the second tarsal segment; the shape of the SMCs of the fore wing is almost identical to that of the type. The male paratype is 7 mm. long and is more extensively silvery than the allotype, the greater part of the thorax, leg-bases, and base of the abdomen being silvery-sericeous; the front, vertex, and propodeum have more numerous erect hairs than does the allotype. MID is .63 X TFD; the third antennal segment is 1.7 X as long as thick. In all other respects it is very similar to the allotype.

Remarks. — The occurrence of this species in Montana should probably be questioned pending further evidence.

Genus *TASTIOTENIA* Evans

Tastiotenia Evans, 1950, Trans. Amer. Ent. Soc., 75: 150-153 [Type species: *Tastiotenia festiva* Evans, monobasic].

Generic characters. — Small wasps, 3.0-6.5 mm. in length, patterned with black, whitish, and ferruginous. Body clothed with pale pubescence which is dense and suberect on the propodeum of the male, but wholly without erect setae, the tip of the abdomen of the female with some weak, pale, subappressed

setae. Head rather thick, the temples strongly developed in both sexes; malar space practically absent. Mandibles with a single tooth on the inner margin; labrum barely exerted in resting position. Clypeus a narrow transverse band, truncate apically, not wider than the lower part of the broad front. Antennae relatively short, third segment in the female equal to not much if any more than half UID, third segment in the male not or but slightly longer than the second segment; apical segment of male antenna abruptly, obliquely truncate. Ocelli in a broad triangle on a broad vertex which arches above the tops of the eyes. Pronotum of male quite short, feebly angulate behind; that of the female somewhat longer, although shorter than the mesoscutum along the midline, sloping very weakly. Postnotum strong, approximately as long as the metanotum or even slightly longer. Propodeum with the slope low, nearly flat behind, the posterior rim practically absent. Legs weakly spinose; female without a tarsal comb and without spines beneath the apical tarsal segments; all tarsal claws dentate in both sexes, in the male weakly so, pulvillar pad and comb very weakly developed; male with the last segment of the front tarsus unmodified and the two claws alike, this sex with the hind tibial spurs and the basal parts of the tarsus relatively very broad and strongly flattened. Fore wing with the transverse median vein meeting media basad of the basal vein, the latter somewhat arched on its lower part; marginal cell removed from the wing tip by slightly more than its own length, the radial vein more or less evenly arcuate; three SMCs present; hind wing with the anal vein straight, paralleling the pre-axillary furrow, the transverse median vein leaving it at a sharp angle and meeting the media far basad of the origin of the cubitus (fig. 9). Male abdomen without unusual modifications, the SGP rather narrow, tectiform; genitalia with slender, slightly curved parameres, basal hooklets double, aedoeagus much expanded apically.

Distribution. — Deserts of the Sonoran subregion of the Nearctic region. Only one species is known.

Remarks. — The venation of the hind wing of this genus suggests *Epipompilus* and *Allaporus*, and the pronotum of the female is somewhat elongate as in those genera, but there are no other noteworthy similarities. The general form of the body (especially the propodeum) suggests *Ceropales*, but the male genitalia seem closest to *Pompilus* (*Perissopompilus*). This genus represents a most puzzling assortment of characters, suggesting that it may be a relic of a very early stock of Pompilinae.

Tastiotenia festiva Evans

Tastiotenia festiva Evans, 1950, Trans. Amer. Ent. Soc., 75: 152-153 [Type: ♀, MEXICO: SONORA: Guaymas, 29 Sept. 1923 (W. M. Mann) (USNM, no. 59, 477)]. — Evans, 1954, Pan-Pac. Ent., 30: 103-104

(male). — Evans, 1961, Southwest. Nat., 6: 51-52 (distribution and biology).

Female. — Length 4-6.5 mm. Head black except the mandibles and clypeus partly or wholly suffused with castaneous, the antennae varying from dusky castaneous to black; pronotum varying from rufo-castaneous to black, marked with white on the collar and along the posterior margin; mesoscutum, scutellum, metanotum, postnotum, mesopleura, and mesosternum largely or wholly blackish; propodeum, metapleura, propleura, and front and middle coxae varying from rufo-castaneous to blackish; legs otherwise pale rufo-castaneous except sometimes infuscated apically, the front legs sometimes wholly so; abdomen wholly pale rufo-castaneous. Wings hyaline except fore wing with an apical fuscous band. Clypeus about 3.5 X as wide as high; front and vertex very broad, MID .64-.68 X TFD; third antennal segment .40-.55 X UID. SMC3 of rather variable size but always much smaller than the second.

Male. — Length 3-5 mm. Predominantly black, the pronotum with a whitish band behind, including the posterior lobes, and the apical abdominal tergite usually with a white spot; mouthparts, pronotum, and metapleura suffused with rufo-castaneous; hind femora in large part rufo-castaneous, sometimes also the hind coxae, trochanters, and tibiae and the middle femora and tibiae; front legs and abdomen sometimes in part suffused with brownish; wings as in female. Front broad, the eyes nearly parallel, UID and LID nearly equal; POL equal to or exceeding OOL. Antennae very compact, segment three only slightly longer than thick, middle flagellar segments very slightly if at all longer than thick. Terminalia as figured by Evans, 1954, figs. 1 and 2.

Distribution. — Deserts, southern California to western Texas, south into northern Mexico. Evans (1961) summarized distribution records as of that date. More recently I have taken two females in western Texas, one at El Paso, 4 May 1963, one 3 mi. E of Presidio, 23 April 1963, both on desert sand. (Map 26.)

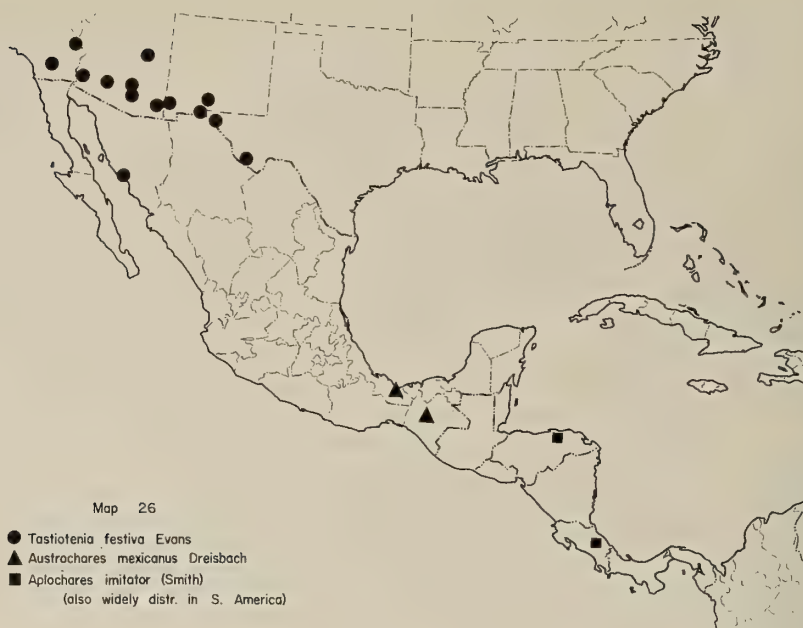
Mexican specimens examined. — 1 ♀. SONORA: 1 ♀, Guaymas, 29 Sept. 1923 (W. M. Mann) [type, USNM].

Genus *AGENIOIDEUS* Ashmead

Agenioideus Ashmead, 1902, Canad. Ent., 34: 85 [Type species: *Pompilus humilis* Cresson, monobasic]. — Evans, 1950, Trans. Amer. Ent. Soc., 75: 189-201 (revision).

Aporoideus Ashmead, 1902, Canad. Ent., 34: 86 [Type species: *Pompilus sericeus* Van der Linden, monobasic]. Synonym by Evans, 1950.

Generic characters. — Size 3.5-17 mm.; wings often longer than the body. Black or ferruginous, pubescence not reflecting metallic colors, males with the last abdominal tergite whitish, sometimes with other pale markings. Body with



at most some sparse, fine hairs on the head, thoracic dorsum, propodeum, and tip of abdomen; tip of abdomen not bristly. Mandibles with one or two teeth on the inner margin. Clypeus large, wider than LID in female. Inner orbits converging above. Antennae long and slender, third segment in female exceeding UID. Pronotum short, its posterior margin angulate or subangulate. Postnotum at least one third as long as metanotum. Propodeal slope low and even, with or without transverse striae. Legs slender, weakly to moderately spinose; female with or without a comb on the front tarsus. Claws dentate in both sexes, except inner claws of front tarsi of male more strongly curved and somewhat bifid, but apical segment of front tarsus of male symmetrical, not lobed on inner side. Pulvillar pad small, the comb of about 7 weak, diverging setulae. Fore wing with stigma rather large, marginal cell large, removed from wing tip by less than its own length; three SMCs present; third discoidal cell long, the second recurrent vein arising considerably more than half way from base of subdiscoidal vein to margin of wing; hind wing with anal vein arching up to meet median vein before cubital fork; anal lobe not over half as long as submedian cell (fig. 10). Male genitalia with the basal hooklets single; parameres slender; parapenial lobes slender.

Distribution. — This genus is widely distributed throughout the globe, but shows considerable structural diversity. The American species fall into three subgenera, which may be separated by the following key.

KEY TO SUBGENERA

1. Apical tarsal segments of female with a few median spines beneath; male SGP nearly flat, not strongly compressed or keeled *Ridestus* Banks
 Apical tarsal segments without spines beneath; male SGP strongly compressed, keeled 2
2. Female with tarsal comb present; male with third antennal segment slightly longer than fourth; our species with banded wings and a white spot on the hind tibia *Agenioideus* Ashmead
 Female without a tarsal comb; male with third antennal segment shorter than fourth; our species with wings unbanded and tibiae immaculate *Gymnochaes* Banks

Subgenus **RIDESTUS** Banks

Ridestus Banks, 1912, Jour. N. Y. Ent. Soc., 19: 223 [Type species: *Psammochaes transversalis* Banks (= *biedermani* Banks), original designation].

Subgeneric characters. — Clypeus of female weakly emarginate, that of male rounded or subtruncate. Antennae very slender, third segment in female about 7 X as long as thick, in male at least 3 X as long as thick. Propodeum of female obscurely to rather strong transversely rugose, that of male with coarse silvery pubescence. Front tarsus of female with a comb of long, slender spines, apical tarsal segments in this sex with a row of small spines beneath. Male SGP moderately broad, nearly flat; genitalia with the parameres curved but slightly, aedoeagus simple, without a setae or apical lobes.

Distribution. — Southern parts of Nearctic and Palaearctic regions.

Included species. — The type species, *biedermani*, occurs widely in western United States and northern Mexico. A second species, described below as *rubicundus*, inhabits central Mexico. This species, known from males only, may be distinguished from *biedermani* by its almost wholly ferruginous coloration and by minor differences in the terminalia.

Agenioideus (*Ridestus*) *biedermani* (Banks)

Pompilus mexicanus Taschenberg, 1869, Zeitschr. Ges. Naturw., 34: 52 [Type: ♀, "MEXICO" (Zool. Inst., Halle, Germany)]. Preoccupied by Cresson, 1867. — Cameron, 1893, Biol. Centr.-Amer., Hymen. II, p. 193.

- Psammochares biedermani* Banks, 1910, Jour. N. Y. Ent. Soc., 18: 116 [Type: ♂, ARIZONA: Palmerlee, July (Biederman) (MCZ, no. 13, 706)].
- Psammochares striatulus* Banks, 1910, *ibid.*, p. 119 [Type: ♀, ARIZONA: Palmerlee, Aug. (Biederman) (MCZ, no. 13, 662)]. Synonym by Evans, 1950.
- Psammochares transversalis* Banks, 1910, Psyche, 17: 248 [Type: ♀, ARIZONA: Palmerlee, Aug. (Biederman) (MCZ, no. 13, 661)]. Synonym by Evans, 1950.
- Gymnochares biedermani* Banks, 1919, Bull. Mus. Comp. Zool., 63: 239. — Dreisbach, 1949, Ent. Amer., (n.s.) 29: 40, pl. IV, fig. 18.
- Arachnophroctonus anahuacensis* Bradley, 1944, Notulae Nat., Acad. Nat. Sci. Phila., no. 145, p. 10 (new name for *mexicanus* Tasch., nec Cresson). New synonym.
- Agenioideus (Ridestus) biedermani* Evans, 1950, Trans. Amer. Ent. Soc., 75: 192-195.

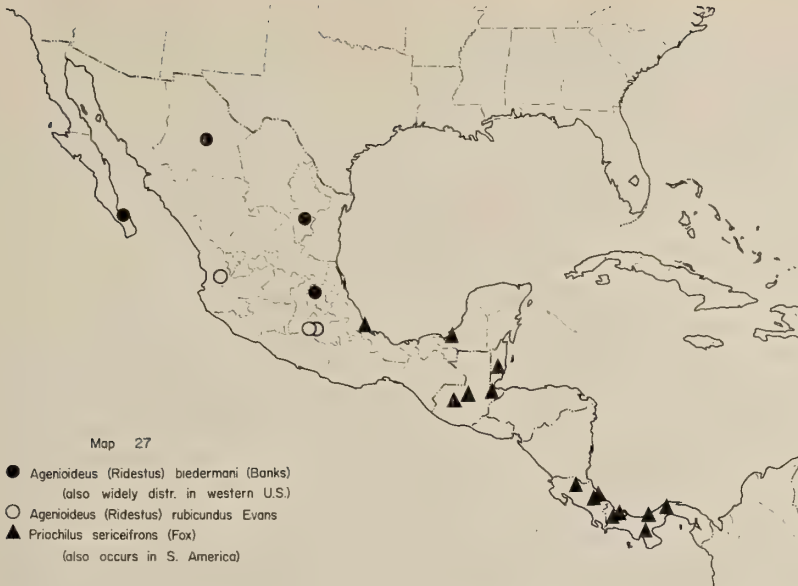
The type of Taschenberg's *mexicanus* is in good condition and is a typical specimen of Banks' *biedermani*.

Female. — Length 7-17 mm. Black, inner and outer orbits each with a very small pale spot; fore wings lightly to rather heavily infuscated. Pubescence very fine, brownish or cinereous, often silvery on sides of lower front. Body with only a few erect hairs, propodeum and legs completely without erect hairs. Front narrow, MID .52-.58 X TFD; UID .75-.80 X LID; third antennal segment 1.2-1.7 X UID. Rugae of propodeum varying from fairly strong to barely perceptible. Front basitarsus with three comb-spines, the apical one about as long as second tarsal segment. Fore wing with stigma large, SMC3 wide above.

Male. — Length 5.5-11 mm. Black, orbits spotted as in female, apical tergite white; wings hyaline, apical margin of fore wing and tip of hind wing infuscated. Pubescence extensively silvery, rather coarse on posterior slope of propodeum. Clypeus 1.5-1.7 X as wide as high, rounded or subtruncate below. MID .57-.60 X TFD; UID and LID subequal. Third antennal segment about 3 X as long as thick, usually slightly exceeding four. Postnotum nearly as long as metanotum. Wings as in female. SGP broadly rounded apically, the midline roundly elevated toward the base. Genitalia with the digiti slender, clothed with sparse setae of moderate length (see figures in Dreisbach, 1949, and Evans, 1950).

Distribution. — Oregon, Utah, and Kansas south to Baja California and Hidalgo. The Montana record I presented in 1950 is questionable; I have since seen a male from The Dalles, Oregon [OSU]. (Map 27.)

Mexican specimens examined. — 4 ♀♀, 1 ♂. BAJA CALIFORNIA: 1 ♀, La Paz, 5 June [CAS]. CHIHUAHUA: 1 ♀, Tinaja



[USNM]. NUEVO LEON: 1 ♀, Galeana, 5-6000 feet, 3 Aug. 1939 (R. Haag) [USNM]. HIDALGO: 1 ♀, 1 ♂, Zimapán, 6400 feet, June, July (HEE, B. D. Valentine) [MCZ].

Agenioideus (Ridestus) rubicundus new species

Holotype. — ♂, MEXICO: MORELOS: 3 mi. N Alpuyeca, 3400 feet, 18 April 1959 (HEE) [MCZ, no. 30, 963].

Description. — Length 7 mm.; fore wing 6.5 mm. Color ferruginous except propleura, posterior lateral margins of pronotum, and posterior part of mesosternum black, inner and outer orbits with a small yellowish streak; first two antennal segments ferruginous, rest of antenna dark brown; legs ferruginous except middle and hind tarsi strongly infuscated. Wings faintly tinged with brownish, apical margin of fore wing and tip of hind wing slightly darker. Entire body covered with fine silvery pubescence; erect hairs virtually absent except for some whitish ones on temples and propleura. Clypeus 1.6 X as wide as high, its apical margin weakly rounded, subtruncate. Front rather narrow, MID .56 X TFD; UID and LID subequal; POL very slightly exceeding OOL. First four antennal segments in a ratio of about 23:12:25:23, segment three 3.3 X as long as wide. Pronotum short, subarcuate behind; postnotum at mid-line nearly as long as metanotum, transversely striate; propodeum with the slope low and even, without a median impression. Middle and hind tibiae

with sparse, rather strong black spines; longer spur of hind tibia .66 X length of hind basitarsus. Fore wing with basal and transverse median veins interstitial, SMC3 narrowed by slightly more than half above. SGP similar to that of *biedermani*, rounded apically, rather flat except for a strong median elevation toward the base. Genitalia with the parameres slender, with a membranous strip along the inner margin and with a small, acute squama about halfway to the apex; digiti slightly wider than in *biedermani*, the inner apex subangulate, the surface sparsely setose; aedoeagus simple, shorter than the parapegial lobes (fig. 37).

Distribution. — Central Mexico. (Map 27.)

Paratypes. — MORELOS: 1 ♂, 12 mi. E Cuernavaca, 14 Aug. 1962, 4000 feet (RHP) [USNM]. NAYARIT: 1 ♂, Ahuacatlan, 18-22 July 1951 (HEE) [MCZ].

Variation. — In the paratypes the fore wing varies from 6 to 8 mm. long. The Morelos specimen is colored much like the type, but the flagellum and tarsi are nearly black, the mesosternum is wholly black, and the ocellar triangle is black. Body measurements are very similar to those of the type; in both the paratypes POL:OOL is about as 5:4. The Nayarit specimen has a slightly wider front than the other two, MID measuring .59 X TFD. This specimen is colored somewhat differently, the inner and outer orbits having a stronger yellowish streak and the posterior margin of the pronotum a yellowish stripe; also, the following are suffused with blackish: central part of upper front, extending through ocelli to occiput; extreme anterior part of mesoscutum; sides of scutellum and all of metanotum and postnotum; a broad band down center of propodeum; propleura, mesosternum, and anterior parts of meso- and metapleura; trochanters, tibial spurs, and tarsi also strongly infuscated.

Subgenus *AGENIOIDEUS* Ashmead

Agenioideus Ashmead, 1902, Canad. Ent., 34: 85 [Type species: *Pompilus humilis* Cresson, monobasic].

Aporoideus Ashmead, 1902, *ibid.*, p. 86 [Type species: *Pompilus sericeus* Vander Linden, monobasic].

Subgeneric characters. — Clypeus subtruncate, in female sometimes weakly produced medially. Head very thin; inner orbits convergent above in both sexes. Propodeum with the slope low and even, with shallow longitudinal grooves behind the spiracles, but without more than a faint suggestion of transverse rugae; posterior slope with coarse silvery pubescence in both sexes, in the

female also with a few erect hairs in our species. Female with a strong tarsal comb, but apical tarsal segments not spined beneath. Male SGP strongly compressed, keel-shaped; genitalia with the aedoeagus bilobed apically, bearing a few setae, parameres somewhat elbowed about midway.

Distribution. — Palaearctic and Nearctic regions, with the single Nearctic species, *humilis*, ranging south to Panama.

Agenioideus (*Agenioideus*) *humilis* (Cresson)

Pompilus humilis Cresson, 1867, Trans. Amer. Ent. Soc., 1: 91 [Type: ♀, NEW YORK (no further data) (ANSP, no. 552)].

Agenioideus humilis Ashmead, 1902, Canad. Ent., 34: 85 — Dreisbach, 1949, Ent. Amer. (n.s.) 29: 38, pl. III, fig. 13.

Agenioideus (*Agenioideus*) *humilis* Evans, 1950, Trans. Amer. Ent. Soc., 75: 196-198, figs. 37, 39, 58.

Female. — Length 5.5-10.5 mm. Black; inner orbits usually with a small pale spot near base on outer side; wings hyaline, fore wings with a brownish band at marginal cell, not reaching hind margin of wing, and a weaker band just before outer wing margin. Body pubescence extensively silvery, propodeum with a few setae extending above the pubescence. Clypeus with a very weak median projection in most specimens. MID .57-.62 X TFD; inner orbits strongly convergent at top, UID about .7 X LID; third antennal segment 1.0-1.6 X UID. POL:OOL about as 3:2. Front basitarsus with three comb-spines, the apical one about as long as second tarsal segment. SMC3 strongly narrowed above (fig. 10).

Male. — Length 4-9.5 mm. Black, the hind tibiae with a whitish basal spot or streak and the apical tergite whitish; inner orbits usually with a small pale spot; banding of wings as in female, but much weaker, sometimes barely evident. Body extensively silvery-pubescent, propodeum with or without a few setae extending above the pubescence. Clypeus about twice as broad as high, its apical margin subtruncate. MID .58-.62 X TFD; UID .82-.90 X LID. Third antennal segment about 2.5 X as long as thick. Postnotum nearly as long as metanotum. SMC3 often triangular or nearly so. Terminalia as figured by Dreisbach, 1949, and Evans, 1950.

Distribution. — This species occurs across southern Canada, throughout the entire United States, and as far south as Panama. However, it is rather local in distribution, occurring chiefly around cliffs, stone walls, and old buildings. (Map 23.)

Mexican and Central American specimens examined. — 8 ♀♀, 4 ♂♂. MEXICO: MORELOS: 4 ♀♀, Cuernavaca & vic., Mch.-May [USNM, MCZ, CU]; 2 ♂♂, Canyon de Lobos, nr. Yautepec, 7-13 March 1959 (HEE) [MCZ, CU]. GUATEMALA: 2 ♂♂, Moca

Guatalon, 1000 meters, Mch., Apr. 1941 (JB) [MCZ]; 2 ♀ ♀, El Salto, Escuintla, 28 June 1934 (FXW) [MCZ]. PANAMA: 2 ♀ ♀, El Volcan, Chiriqui, May 1936 (H. A. Senn) [AMNH].

Subgenus GYMNOCHARES Banks

Gymnochares Banks, 1917, Bull. Mus. Comp. Zool., 61: 107 [Type species: *Psammochares birkmanni* Banks, designated by Pate, 1946]. — Banks, 1934, Proc. Amer. Acad. Arts and Sci., 69: 99 (Philippine spp.).

Subgeneric characters. — Clypeus truncate apically. Front rather narrow, inner orbits convergent above in female. Propodeum either smooth and strongly silvery-sericeous or with transverse striae. Legs weakly spinose; spines of hind tibia small, not half as long as width of tibia at their base; front tarsus of female without a comb; apical tarsal segments not spined beneath. Stigma rather large; SMC3 usually wide above. Abdomen of male short, the apical segments normally telescoped into the basal segments; SGP very strongly compressed; genitalia with the aedoeagus simple, the parameres in our species elbowed about midway.

Distribution. — Palaearctic, Oriental, and Nearctic. The only species known to occur in Mexico or Central America is *birkmanni*, which is also widely distributed in the United States.

Agenioideus (*Gymnochares*) *birkmanni* (Banks)

Psammochares birkmanni Banks, 1910, Jour. N. Y. Ent. Soc., 18: 116 [Type: ♂, TEXAS: Lee Co., 16 Sept. 1906 (G. Birkman) (MCZ, no. 13, 707)].

Gymnochares texana Banks, 1944, Bull. Mus. Comp. Zool., 94: 170 [Type: ♀, TEXAS: Austin, 5 June 1900 (A. L. Melander) (MCZ, no. 25, 704)]. Synonym by Evans, 1950.

Agenioideus (*Gymnochares*) *birkmanni* Evans, 1950, Trans. Amer. Ent. Soc., 75: 199-201, figs. 38, 41.

Female. — Length 5-11 mm. Wholly black; wings varying from nearly hyaline to rather heavily infuscated, somewhat violaceous. Pubescence very fine, silvery at least on sides of front, often almost wholly silvery; body almost entirely without erect hairs. Front narrow MID .50-.60 X TFD; UID .65-.80 X LID; third antennal segment 1.1-1.6 X UID. Ocelli in a compact triangle, POL:OOL about as 3:2. Propodeum with transverse rugae which vary from strong to very weak. Abdomen short and stout.

Male. — Length 3.5-6.5 mm. Black, apical tergite mostly whitish; wings usually hyaline, with a dark marginal band, occasionally wholly lightly infuscated. Body in large part silvery-sericeous, the pubescence coarse and suberect

on the propodeum; body practically without erect hairs. Clypeus about or slightly less than twice as broad as high. MID .54-.62 X TFD; UID subequal to or slightly exceeding LID. Third antennal segment 1.5-2.0 X as long as thick, always distinctly shorter than fourth. Postnotum slightly shorter than metanotum. Longer spur of hind tarsus .7 as long as basitarsus. Abdomen very short; terminalia as figured by Evans, 1950.

Distribution. — New Jersey, Kansas, and Oregon south to Georgia and to Guerrero and Oaxaca. The species is much less uncommon in the western part of its range, and most of the Mexican records are from the western half of the country. The New Jersey record is unpublished, and is based on several specimens collected by V. S. L. Pate at Medford Lakes [CU]. (Map 28.)

Mexican specimens examined. — 15 ♀♀, 28 ♂♂. COAHUILA: 1 ♀, Fuente, 12 June [CIS]. SONORA: 1 ♂, Ciudad Obregon, 2 Nov. 1955 (A. Zazueta) [ENAC]. BAJA CALIFORNIA: 1 ♂, 28 mi. S El Arco, 4 July 1960 (AEM) [CIS]; 1 ♀, Mouth of Rio Santelino, 21 Sept. [CAS]; 1 ♂, Isla Partida, Gulf of Calif., 23 March 1953 (P. H. Arnaud) [CAS]; 1 ♂, Cedros Isl., 3 June 1925 (H. H. Keifer) [CAS]; 1 ♂, Angeles Bay, 7 May 1921 (E. P. Van Duzee) [CAS]; 7 ♀♀, 3 ♂♂, Clarion Island, Revillagigedos, 26-30 Apr. 1925 (H. H. Keifer) [CAS, CIS]. SINALOA: 1 ♀, 8 mi. SE Elota, 18 May 1962 (FDP) [UCD]; 1 ♀, 9 mi. E Chupaderos, 15 May 1962 (FDP) [UCD]. GUERRERO: 1 ♂, 3 mi. N Chilpancingo, 4000 feet, 19 March 1959 (HEE) [MCZ]. MORELOS: 4 ♂♂, Cuernavaca & vic., 4500-6000 feet, Mch.-June (HEE, FDP) [CU, UCD, MCZ]; 2 ♀♀, 3 ♂♂, 3 mi. N Alpuyeca, 3400 feet, Mch.-May 1959 (HEE) [CU, MCZ]; 1 ♂, 6 mi. S Temixco, 30 Mch. 1962 (LS) [UCD]. PUEBLA: 1 ♂, 3 mi. NW Petlalcingo, 2 April 1962 (LS) [UCD]. OAXACA: 2 ♀♀, 10 ♂♂, 23 mi. S Matias Romero, 5 Apr. 1962 (LS, FDP) [UCD, MCZ].

Variation. — Females from the southern parts of the range tend to have the wings rather heavily infuscated, violaceous, and the silvery pubescence of the body much reduced.

Genus *PRIOCHILUS* Banks

Priochilus Banks, 1944, *Psyche*, 50: 82 [Type species: *Pompilus nobilis* Fabricius (i.e., *Sphex nobilis* Fabr. 1787, *nec* Scopoli 1763; = *gloriosum multifasciatum* Taschenberg), original designation]. — Banks, 1944, *Zoologica*, 29: 104-106 (Br. Guiana spp.). — Banks, 1946, *Bull.*



Mus. Comp. Zool., 96: 510-520. — Dreisbach, 1950, Bull. Brooklyn Ent. Soc., 45: 50-59 (North American spp.).

Argyrogenia Bradley, 1944, Notulae Nat., Acad. Nat. Sci. Phila., no. 145, p. 6 [Type species: *Pompilus gloriosus* Cresson, monobasic].

Foximia Banks, 1945, Bol. Ent. Venez., 4: 97-99 [Type species: *Pompilus scrupulum* Fox, original designation; proposed as subgenus of *Priocheilus*]. — Banks, 1946, Bull. Mus. Comp. Zool., 96: 510. New synonym.

Ectemnagenia Haupt, 1959, Nova Acta Leopoldina, v. 21, no. 141, pp. 28, 64 [Type species: *Pompilus nobilis* Fabricius, monobasic]. New synonym.

Acanthagenia Haupt, 1959, *ibid.*, pp. 28-29, 64-66 [Type species: *Pompilus regius* Fabricius, original designation]. New synonym.

Generic characters. — Small to rather large wasps (6-22 mm.), with rather slender bodies and elongate wings. Antennae and palpi relatively long and slender; mandibles with one or two teeth on the inner margin basad of the apical tooth; malar space absent or nearly so; eyes relatively very large and the front narrow, MID generally less than half TFD in the females; head contracted immediately behind the eyes, the temples not developed. Scutellum prominent; postnotum a fairly strong transverse band; propodeum without a well-defined declivity, the slope rather smooth. Legs rather spinose but female without a tarsal comb; femora often with small spine-pits on the upper side apically; middle and hind tibiae spinose, the hind tibiae of the female with or

without a carina or series of serrations above; apical tarsal segments with a median row of spines beneath in the females; middle and hind tarsi of male with the pubescence suberect, bristling; pulvillar pad small, the comb very weak; last segment of front tarsus of male unmodified; all claws of both sexes bifid, the inner ray truncate, except that in most species some of the claws of the male are simple (except for a basal swelling). Fore wing with the marginal cell large, removed from the wing tip by at most its own length, the radial vein nearly evenly arcuate; SMC3 wide above; transverse median vein usually meeting media slightly beyond the origin of the basal vein; hind wing with the anal vein arching up to meet media at or slightly before the origin of cubitus (fig. 11). Abdomen of female rather slender, the second sternite with an indistinct transverse impression; abdomen of male very slender, especially basally; sixth sternite of male with a strong apical emargination; male SGP rather broad basally and internally, rather slender and tapering apically, the midline somewhat elevated (figs. 71-73); male genitalia with the basal hooklets double, single, or absent; parameres without a strong squama; aedoeagus expanded in various ways apically, with at least minute setae on the shaft (figs. 31-36).

Distribution. — This is a strictly Neotropical genus, largely restricted to areas of rain forest, occurring widely throughout northern South America, north to Dominica in the Lesser Antilles and to southern Mexico, one species occurring also in Jamaica.

Remarks. — Most authors have placed this genus in the Pepsinae or "Cryptocheilinae" (Banks and Dreisbach), while Haupt recently included it in his review of the "Macromerinae" (Auplopodini). Personally I regard the genus as a pompiline, probably an offshoot of *Agenioideus*, which has shown convergence toward the Auplopodini by reason of its unusual nesting behavior. Williams (1928, Bull. Hawaiian Sugar Planters' Assoc., Ent. Ser., no. 19, pp. 140-142) found two species (*regium* and *gloriosum multifasciatum* [= *nobile*]) lining their nests with bits of leaves, the former under bark and the latter in a rolled-up dead palm leaf sheath. Some species of *Agenioideus* nest in pre-existing cavities, and there are many structural similarities between this genus and *Priochilus*. Characters which clearly indicate that this genus belongs in the Pompilinae are: spine-pits on the femora of some species; splayed-out spines at the apices of the tibiae; a median row of spines beneath the apical tarsal segments; and lack of a groove on the second sternite (save for a vague impression no different from that of some species of *Agenioideus*).

A great many names are available for the approximately twenty

species of this genus. I have indicated much new synonymy in my treatment of the ten species known to enter Central America, and it is probable that there are still additional synonyms of some of these ten species. For the most part the species are separable by fairly clear-cut and conspicuous differences, but I can see no justification for dividing the genus into genera or subgenera as Haupt and Banks have done.

*Key to Species*¹⁰

Females

1. Mandibles with two teeth on the inner margin besides the apical tooth; labrum with a narrow to fairly broad polished band along its apical margin 2
- Mandibles with only one tooth besides the apical tooth; labrum without a complete polished band along its margin; apical tergite with dense, long, closely appressed spines 8
2. Clypeus with a broad, rectangular apical projection; apical tergite with dense, thick, semierect spines which underlie the sparse, long setae; propodeum with white hairs, also with transverse rugae toward the upper part of the slope *gloriosum gloriosum* (Cresson)
- Clypeus simple, without such a projection; apical tergite without thick spines underlying the long setae; propodeum bare or nearly so, without rugae or the rugae present but located on the posterior slope 3
3. Small to fairly large species; third antennal segment at most 1.45 X UID; fore wings hyaline or nearly so, strongly banded; front coxae in front with only some short, weak setae if any; body and legs black 4
- Large species with extremely long antennae, the third segment at least about 1.5 X UID; fore wings wholly infuscated, the banding rather indistinct; front coxae with long, dark setae in front; abdomen rufous or legs in part rufous 7
4. Hind tibiae without evidence of a carina or serrations; apical abdominal tergite with sparse and rather slender setae 5
- Hind tibiae with a series of serrations; apical tergite with rather dense, bristly setae apically 6
5. Front with fine, silvery to light brown pubescence; propodeum smooth; clypeus weakly notched medially, the apical polished rim very narrow; length under 10 mm. *gracile* n. sp.
- Front with dense, golden pubescence; propodeum with transverse rugae; clypeus truncate, the apical polished rim fairly wide; length over 12 mm. *sericeifrons* (Fox)

¹⁰ One species, *fustiferum* n. sp., is known from the male sex only.

6. Hind tibiae very weakly serrate in profile; first intercubital vein only slightly if at all more oblique than the second, SMC2 narrowed only slightly if at all above; fore wing tinged with luteous between the two major bands *scrupulum* (Fox)
Hind tibiae quite distinctly serrate, each serration tipped with a small spine; first intercubital vein very strongly oblique as compared to the second, SMC2 narrowed by half or more above (fig. 11); fore wing not tinged with luteous *splendidulum splendidulum* (Fabricius)
7. Abdomen black and with dark pubescence and setae; middle and hind coxae, trochanters, and femora bright rufo-castaneous; carina on hind tibia rather weak, crenulate but not really serrate in profile *admirationis admirationis* (Cameron)
Abdomen rufo-castaneous, with golden to brownish-orange pubescence and setae; legs black; carina on hind tibia rather strong, distinctly serrate toward the base *formosum hondurensense* Dreisbach
8. Clypeus truncate or gently concave apically; propodeum with dense, conspicuous silvery pubescence and white hairs; third antennal segment exceeding UID; length 12-21 mm. *veraepacis* (Cameron)
Clypeus with a shallow median emargination; propodeum with blackish pubescence and setae; third antennal segment 0.9-1.1 X UID; length 7-11 mm. *captivum* (Fabricius)

Males

1. Two or three of the basal abdominal segments marked basally with white or pale yellow; clypeus and/or lower front with pale markings; claws of middle tarsi bifid 2
Abdomen without such markings on the basal segments; clypeus and front wholly black; claws of middle tarsi with only a weak basal tooth, like those of the hind tarsi 5
2. First abdominal segment marked with pale as well as the second and third; clypeus black; ocelli quite large, OOL not much if any exceeding POL; claws of hind tarsi bifid; length 10.5-14.5 mm. *sericeifrons* (Fox)
First abdominal segment black, not annulated with pale; clypeus with white markings; ocelli small, OOL much exceeding POL; claws of hind tarsi with only a weak basal swelling; small, delicate species, length 5.5-9 mm. 3
3. Apex of SGP abruptly truncate or slightly emarginate (fig. 72); basal hooklets of genitalia wanting (fig. 32); lower inner orbits with white spots; clypeus white except usually with a dark spot medially *scrupulum* (Fox)
Apex of SGP acute or subacute (fig. 71); basal hooklets of genitalia well developed (figs. 31, 36); lower inner orbits without white spots; clypeus variable 4

4. Eyes strongly divergent above, UID 1.35 X LID; first intercubital vein moderately oblique, SMC2 narrowed by about .4 above, slightly narrower on the radius than SMC3; aedoeagus simple, digiti little expanded on the inner margin and with the setae there little different from the others (fig. 36) *gracile* n. sp.
 Eyes moderately divergent above, UID 1.1-1.3 X LID; first intercubital vein strongly oblique, such that SMC2 is strongly narrowed above, much narrower on the radius than SMC3 (fig. 11); aedoeagus and digiti very different from above (fig. 31) *splendidulum splendidulum* (Fabricius)
5. Propodeum without erect hairs; legs and abdomen marked with rufous or the digiti of the genitalia clothed with a large number of short, strongly clubbed setae 6
 Propodeum with abundant white or dark erect hairs; without rufous markings; digiti without clubbed setae or such setae of two different sizes, some quite long 7
6. Body and legs entirely black; wings hyaline, fore wing strongly twice-banded; genitalia as shown in fig. 33 *fustiferum* n. sp.
 Legs and/or abdomen marked with rufous; genitalia not as above
 *admiracionis admiracionis* (Cameron) and *formosum hondurens*
 Dreisbach ¹¹
7. Wings hyaline, fore wings with two strong fuscous bands; third antennal segment unusually long, about 6-8 X as long as thick, much longer than fourth segment, much exceeding UID *gloriosum gloriosum* (Cresson)
 Fore wings wholly fuscous, violaceous; third antennal segment not more than 5 X as long as thick, slightly if any longer than fourth segment, not longer than UID 8
8. Propodeum with dense, conspicuous silvery pubescence and with whitish hairs; length 13-15 mm.; hind wings partly hyaline; SMC2 about 1.5 X as wide as high *veraepacis* (Cameron)
 Propodeum with dark pubescence and blackish hairs; length 7-10 mm.; wings wholly fuliginous or fore wings with indistinct banding; SMC2 not much if any wider than high *captivum* (Fabricius)

Priochilus gracile new species

Holotype. — ♀, COSTA RICA: Monteverde, 10°29' N, 84°50' W, 1400 meters, 11 Feb. 1963 (CWR) [MCZ, no. 30, 964].

The small size, non-serrate hind tibiae, and relatively short marginal cell of this species suggest *Agenioideus*. The male is separable

¹¹ Males of these two forms are unknown, although the male of *admiracionis amabile* Banks has been described. The males of both forms will surely key out at this point in the key when discovered; presumably the male *formosum hondurens* will be found to have the abdomen wholly rufous while the male *a. admiracionis* will have the abdomen black or rufous only at the base.

from that of *splendidulum* on only minor characters, as indicated in in the key.

Description of type female. — Length 8.5 mm; fore wing 6 mm. Black, except apical half of mandibles and apical margin of clypeus rufo-testaceous, tarsi somewhat brownish; pubescence silvery over much of body and basal parts of legs, on top of head and parts of thoracic dorsum grading into light brown, T1-3 silvery basally and with darker pubescence apically, abdomen otherwise with the pubescence silvery to cinereous. Fore wing subhyaline, with a strong brown band over the basal vein, through the basal parts of the first two discoidal cells, and barely into the tip of the anal cell; also with a second brown band through the marginal cell and SMC2 and 3, fading out below and not well connected with the weak apical margining band; hind wing hyaline, with a weak apical infuscation. Clypeus, upper front, and thoracic dorsum with a very few strong setae; front coxae not setose in front and propodeum with only some very weak setae on the sides; abdomen sparsely setose ventrally, the apical tergite with a number of long setae, a few of which are somewhat bristle-like. Mandibles with two teeth on the inner margin. Clypeus 2.5 X as wide as its median height, touching the lower eye margins on each side, the margin with a thin polished band, weakly notched medially. Head 1.20 X as wide as high; MID .50 X TFD; UID .85 X MID. Ocelli rather small, in a compact triangle the front angle of which is much less than a right angle; POL:OOL = 3:5. First four antennal segments in a ratio of about 17:7:27:21, segment three .86 X UID; flagellar segments slender, each with a short, broadly elliptical sensorium on the ventral surface. Pronotum short, broadly subangulate behind; postnotum angularly projecting backward medially; propodeum with a strong median impression but with no evidence of rugae. Hind tibia with several rows of strong spines but without evidence of a carina or serrations, the apex with several splayed-out spines. Fore wing with the marginal cell removed from the wing tip by about its own length; stigma about half as long as marginal cell; SMC2 about as high as its maximum width, narrowed by .4 above; SMC3 1.8 X as wide below as SMC2, very slightly wider on radial vein than SMC2; anal vein of hind wing meeting media well before origin of cubitus.

Allotype. — ♂, COSTA RICA: 12 mi. SW Cañas, Guanacaste Prov., 27 February 1964 (HEE) [MCZ].

Description of allotype male. — Length 5.5 mm.; fore wing 5.2 mm. Black, except marked with white as follows: clypeus except for a basal, median black spot, scape beneath, extreme anterior part and posterior margin of pronotum, tibial spurs, a white spot on the outer side of the middle and hind tibiae near their base, basal bands on T2 and T3, and a spot on the apical tergite; mandibles straw-colored except black at base, the teeth rufous; palpi light brown; antennae dark brown except basal segments paler beneath; front tibiae and

tarsi (and to a lesser extent the middle tibiae) suffused with pale ferruginous. Wings hyaline, fore wing with an indistinct band at the basal vein and a somewhat stronger band at the marginal cell, the outer margin also somewhat infuscated. Pubescence conspicuously silvery over much of body; body without erect hairs. Head 1.17 X as wide as high. Clypeus 2.2 X as wide as high, broadly truncate below. MID .56 X TFD, 1.4 X LID; UID 1.35 X LID, the eyes thus very strongly divergent above; POL:OOL = 1:2. Third antennal segment nearly 3 X as long as thick, equal to about half the UID; outer flagellar segments weakly crenulate in profile. Vertex forming a gentle arc above the eye tops. Pronotum subangulate behind; postnotum produced backward medially, on the midline as long as the metanotum; slope of propodeum very low and even. Claws of front and middle tarsi bifid, those of hind tarsi with a weak basal tooth. Fore wing with the marginal cell .8 its own length from the wing tip; SMC2 1.3 X as wide as high, narrowed by about .4 above; SMC3 1.35 X as wide below as SMC2, 1.1 X as wide on the radius. SGP similar to that of *splendidulum* (fig. 71) except relatively broader basally and slightly less elongate, also less hirsute although with a series of stout spines along the margin. Genitalia with the parameres nearly straight, fairly stout; basal hooklets strong, single; digiti not much expanded apically, covered with strong spines, those on the inner margin but little different from the others; aedoeagus simple (fig. 36).

Distribution. — Costa Rica; Surinam. (Map 28.)

Paratypes. — COSTA RICA: 1 ♀, La Fortuna, Alajuela Prov., 600 feet elev., 18 Feb. 1964 (HEE) [MCZ]. SURINAM: 1 ♀, Blakawatra, 11 June 1963 (J. van der Vecht) [Leiden Mus.].

Variation. — The two paratypes are strikingly similar to the type, even though one of them is from a locality far distant from the type locality. The Costa Rica paratype is very slightly larger than the type (fore wing 6.5 mm.); standard measurements are virtually the same as in the type except that UID is .93 X LID, antennal segment three .91 X UID. The Surinam female also has nearly identical standard measurements, but the marginal cell is slightly longer, being removed from the wing tip by only .8 its own length; in this specimen the clypeus is all black, slightly more strongly notched, and about 2.7 X as wide as its median height.

Priochilus sericeifrons (Fox)

Pompilus sericeifrons Fox, 1897, Proc. Acad. Nat. Sci. Phila., 49: 251-252 [Type: ♀, BRAZIL: Santarem (CM)].

Pompilus scutellatus Fox, 1897, ibid., pp. 252-253 [Type: ♂, BRAZIL: Santarem (CM)]. New synonym.

- Pompilus harperi* Cameron, 1912, Jour. R. Agri. Soc. Demerara, 2: 422 [Type: ♀, BRITISH GUIANA (BMNH, no. 19, 706)]. Synonymy by Banks, 1944, confirmed by present writer.
- Priochilus sericeifrons* Banks, 1944, Zoologica, 29: 104, 105 (Br. Guiana). — Dreisbach, 1950, Bull. Brooklyn Ent. Soc., 45: 58.
- Priochilus* (*Foximia*) *aurifrons* Banks, 1945, Bol. Ent. Venez., 4: 98 [Type: ♀, VENEZUELA (R. Lichy) (MCZ, no. 26, 665)]. — Banks, 1946, Bull. Mus. Comp. Zool., 96: 512, 519. New synonym.
- Priochilus* (*Foximia*) *sericeifrons* Banks, 1946, *ibid.*, pp. 512, 519 (Brazil, Br. Guiana, Trinidad, Ecuador).
- Priochilus* (*Foximia*) *scutellatus* Banks, 1946, *ibid.*, pp. 512, 519 (Brazil, Colombia).

The fact that the hind tarsal claws of the male are bifid like those of the other tarsi and that the female completely lacks a carina or serrations on the hind tibia suggest that this is one of the more primitive species of the genus.

Female. — Length 12.5-17.5 mm. Black; pubescence patterned with dark, silvery, and golden; front with rather dense golden pubescence, that on the scape silvery or golden; coxae, lower mesopleura, sides of the metanotum, and posterior part of propodeum with pubescence somewhat denser than elsewhere, silvery but often tinged with golden; pubescence of abdomen very fine, mostly silvery on the basal segments except for dark apical bands. Fore wing with a broad, complete fuscous band over the basal and transverse median veins, a second broad band over the marginal and second and third SMCs, fading out toward the posterior wing margin; outer wing margin narrowly, rather weakly infuscated and many specimens with the submedian cell wholly weakly infuscated; wing membrane between the two bands and between the base and the first band weakly to moderately strongly tinged with brownish; hind wing subhyaline, weakly infuscated apically. Clypeus, front, and mesoscutum with a very few long setae; occiput, propleura, and hind face of front coxae with some short, pale hairs; body otherwise largely devoid of erect setae except for the usual ones on the abdominal venter and apical tergite, the latter relatively thin and sparse. Mandibles with two small teeth along the inner margin. Clypeus 2.2-2.4 X as wide as high, truncate below, the truncate portion with a narrow, polished apical margin. Head 1.20-1.25 X as wide as high; front narrow, MID .44-.48 X TFD; UID .88-.94 X MID, orbits diverging somewhat below. Ocelli rather large and close together, the ocellar triangle slightly elevated above the level of the vertex; POL:OOL about as 4:5. Antennae slender, third segment and those beyond with large, elongate sensoria; third segment equal to from 1.2 to 1.3 X UID. Pronotum broadly subangulate behind; postnotum a transverse band slightly shorter than the metanotum; propodeum weakly to rather strongly transversely rugulose, more particularly on the sides of the posterior

slope. Hind tibia with several series of strong spines, but without evidence of a carina or of serrations. Fore wing with the marginal cell removed from the wing tip by slightly more than half its own length; SMC2 smaller than third, rhomboidal, wider than high, narrowed by much less than half above; anal vein of hind wing meeting media slightly before the origin of the cubitus.

Male. — Length 10.5-14.5 mm. Black, the antennal flagellum light brown beneath, the front tibiae and tarsi often light brown; body maculated with light yellowish as follows: a spot on each side of the face, beside the antennal orbits; collar and posterior margin of pronotum; basal half (or somewhat less) of first three abdominal segments (T1 sometimes with only weak pale markings); a spot on the apical tergite; basal spots on the middle and hind tibiae (sometimes absent); spurs whitish. Wings hyaline, with a narrow band across the basal and transverse median veins (almost entirely distad of those veins) and a slightly wider but incomplete band across the marginal cell and SMC2 and 3. Body pubescence extensively silvery, brownish on parts of the dorsum; body devoid of erect hairs except for a few on the head and prothorax. Head about 1.25 X as wide as high. Clypeus 2.1-2.3 X as wide as high. MID .48-.52 X TFD, about 1.15 X LID; UID 1.05-1.10 X LID. Ocelli unusually large, the distance between the front and hind ocelli much less than the diameter of an ocellus; ocellar triangle elevated above the level of the vertex; POL subequal to or slightly greater or less than OOL. Third antennal segment 3.2-3.4 X as long as thick, slightly longer than fourth segment, equal to about two-thirds the UID. Pronotum arcuate behind; postnotum arcuately expanded medially, as long medially as the metanotum. Fore wing with the marginal cell removed from the wing tip by .55-.65 X its own length; SMC2 rhomboidal, as wide as or slightly wider than high, narrowed only very slightly above; hind wing as in female. SGP tapering evenly to a subacute or narrowly rounded apex, its median line weakly elevated. Genitalia very much as described and figured for the following species, *scrupulum*, the basal hooklets replaced by simple flaps as in that species (fig. 32); the only important differences seem to be that the parapenial lobes of *sericeifrons* are thicker and the mesal margin of the digiti more setose.

Distribution. — This species ranges throughout northern South America and much of tropical Central America, from Brazil and Ecuador to Trinidad and to southern Mexico. (Map 27.)

Mexican and Central American specimens examined. — 30 ♀♀, 8 ♂♂. PANAMA: 1 ♀, Volcan de Chiriqui, 2-3000 feet (GCC) [BMNH]; 1 ♂, Bejuco R. (W. Schaus) [USNM]; 12 ♀♀, 2 ♂♂, Barro Colorado Isl., Canal Zone, Jan.-June (KWC, CWR) [USNM, KU, MCZ]; 1 ♀, Ancon, 20 May 1931 (A. Brody) [CU]; 1 ♀, Santa Rosa, Mch. 1931 (A. Brody) [CU]; 1 ♂, Changuinola Dist. (F. Swift) [CU]; 2 ♀♀, Pearl Isl., San José, 22 June 1944 (Mor-

rison) [USNM]. COSTA RICA: 5 ♀ ♀, 3 ♂ ♂, Turrialba, June-Aug. (KWC, CCP) [USNM, MCZ]; 1 ♀, Cairo, 19 Apr. 1944 (F. Schrader) [USNM]; 1 ♂, La Fortuna, Alajuela Prov., 18 Feb. 1964 (HEE) [MCZ]. GUATEMALA: 1 ♀, Olas de Moka, Dept. Solola, 3000 feet, Sept. (G. P. Englehardt) [MCZ]; 1 ♀, Tamahu, 3500 feet, 10 July 1947 (C. & P. Vaurie) [AMNH]; 2 ♀ ♀, Cayuga, May 1915 (W. Schaus) [USNM]. BRITISH HONDURAS: 1 ♀, Nr. Hummingbird Gap, Stann Creek Dist., 8-11 July 1963 (CCP) [MCZ]. MEXICO: 1 ♀ (no further data) [USNM]; VERACRUZ: 1 ♀, Medellin (H. T. Heyde) [USNM]; CAMPECHE: 1 ♀, Candelaria, Jan. 1945 (M. Guerra) [AMNH].

Priochilus scrupulum (Fox)

Pompilus scrupulus Fox, 1897, Proc. Acad. Nat. Sci. Phila., 49: 252 [Type: ♀, BRAZIL: Santarem (CM)].

Priochilus scrupulus Banks, 1944, Zoologica, 29: 105 (Br. Guiana).

Priochilus (Foximia) clarus Banks, 1945, Bol. Ent. Venez., 4: 98-99 [Type: ♂, COLOMBIA: Muzo, Dept. Boyaca, 20-30 June 1936 (JB) (MCZ, no. 26, 701)]. — Banks, 1946, Bull. Mus. Comp. Zool., 96: 519. New synonym.

Priochilus (Foximia) scrupulus Banks, 1946, Bull. Mus. Comp. Zool., 96: 511, 518 (Brazil, Br. Guiana, Bolivia).

This species is very close to the preceding and to the following species. The male, described as *clarus* by Banks, differs from the male *splendidulum* in having the SGP abruptly truncate or slightly emarginate, the basal hooklets of the genitalia absent, and the first intercubital vein of the fore wing less strongly slanted.

Female. — Length 9-12 mm. Black; pubescence very fine, silvery on the front, scape, much of the prothorax, coxae and parts of the femora and tibiae, mesopleura, lower metapleura, sides of metanotum, posterior slope of propodeum, abdominal venter, and more or less distinct banding on the abdominal dorsum. Fore wing strongly banded, as described for the preceding species, median and submedian cells (except apically) hyaline or nearly so, the wing membrane between the two major bands weakly to moderately tinged with luteous. Clypeus, front, and thoracic dorsum with a very few strong setae, the body otherwise largely devoid of erect setae except for the usual ones on the venter of the abdomen; apical tergite with rather dense bristles. Mandibles with two small teeth along the inner margin. Clypeus 2.5-2.7 X as wide as high, apical margin truncate and with a rather wide polished band. Head about 1.2 X as wide as high; front narrow, MID .43-.46 X TFD; UID .82-.90

X MID, eyes diverging rather strongly on the lower half. Ocelli small, in a compact triangle on the narrow vertex; POL:OOL about as 2:3, in some specimens approaching 1:2. Antennae slender, third segment and those beyond with elongate, rather ill-defined sensoria; third segment equal to 1.10-1.25 X UID. Pronotum obtusely angulate behind; postnotum a transverse band slightly shorter than the metanotum; propodeum with the median line strongly impressed, the surface otherwise smooth, completely without evidence of transverse rugae. Hind tibiae with two series of strong spines on the upper surface, between which there is a series of short spines each of which arises at the lower end of a low elevation; thus, when viewed from the correct angle, the tibiae may be said to be very weakly serrate. Fore wing with the marginal cell removed from the wing tip by .55-.65 X its own length; SMC2 rhomboidal, approximately as high as wide (sometimes slightly higher or not quite as high as wide), narrowed only slightly above, the first and second intercubital veins being approximately parallel; anal vein of hind wing meeting media slightly before the origin of the cubitus.

Male. — Length 6.5-9.0 mm. Black, the antennae beneath and the apical parts of the legs tending to be brownish, the body maculated with whitish as follows: entire clypeus except for a small dark spot in the middle; a spot on each side of the face, opposite the antennal orbits; collar and posterior margin of pronotum; front coxae in front; basal spots on the middle and hind tibiae; all the spurs; basal rings on the second and third abdominal segments; and a large spot on the apical tergite. Wings hyaline, fore wing with a very small infuscation at the basal and transverse median veins and a much stronger band across the marginal and outer two submarginal cells, not reaching the posterior wing margin. Pubescence silvery except dark on some parts of the dorsum; body without erect hairs except for a few on the head and propleura. Head about 1.22 X as wide as high. Clypeus 2.45 X as wide as high, broadly truncate below. MID .50-.53 X TFD, about 1.15-1.20 X LID; UID 1.10-1.18 X LID. Ocelli not enlarged, in a compact triangle; POL:OOL about as 7:10. Third antennal segment about 3.5 X as long as thick, slightly longer than fourth segment. Pronotum broadly angulate behind; postnotum medially about as long as the metanotum. Venation as in female except SMC2 tending to be smaller, often higher than wide, narrowed by .3-.5 above. SGP broad basally, tapering apically but the extreme tip abruptly truncate (usually weakly emarginate), sides of the plate near the base with a group of large punctures which give rise to short, thick setae (fig. 72). Genitalia with the parameres slender; basal hooklets absent, replaced by small flaps; digiti shaped much as in the following species, with a lobe on the mesal margin, sparsely covered with small setae; aedoeagus slender basally, expanded subapically, the tip narrowly bilobed (fig. 32).

Distribution. — Brazil and Bolivia north to the Guianas and to Panama. (Map 28.)

Central American specimens examined. — 5 ♀ ♀, 6 ♂ ♂. PANAMA: 4 ♀ ♀, 6 ♂ ♂, Barro Colorado Isl., Feb., Apr., May, Aug. (CWR) [KU, KSU, MCZ]; 1 ♀, Porto Bello, 21 Feb. 1911 (A. Busck) [USNM].

Variation. — There is some variation in the degree to which the wings of the female are tinged with yellowish; in the Barro Colorado female the yellow is very weak, such that on superficial examination these specimens differ but little from the following species. The males are strikingly similar to those of *splendidulum*, but the differences pointed out in the keys appear to be constant.

Priochilus splendidulum splendidulum (Fabricius) new combination

Pompilus splendidulus Fabricius, 1804, Syst. Piezatorum, p. 193 [Type: ♀, "AMERICA MERIDIONALIS" (?Brit. Guiana) (Schmid) (Copenhagen Mus.)].¹²

Pompilus fragilis Smith, 1864, Jour. Ent., 2: 267 [Type: ♂, BRAZIL: Ega (BMNH, no. 19, 709)]. — Dalla Torre, 1897, Cat. Hymen., VIII, p. 289. — Fox, 1897, Proc. Acad. Nat. Sci. Phila., 49: 255 (Brazil). New synonym.

Pompilus torolae Cameron, 1893, Biol. Centr.-Amer., Hymen. II, p. 207 [Type: ♂, GUATEMALA: Torola, 1000 feet (GCC) (BMNH, no. 19, 721)]. Dalla Torre, 1897, Cat. Hymen., VIII, p. 327. New synonym.

Episyrus torolae Banks, 1931, Bull. Brooklyn Ent. Soc., 26: 133.

Priochilus opacifrons Banks, 1944, Zoologica, 29: 105 (Br. Guiana). — Banks, 1946, Bull. Mus. Comp. Zool., 96: 518 (Brazil, Venezuela, Ecuador) (not *opacifrons* Fox, from Jamaica, here considered subspecifically distinct).

Priochilus hinei Dreisbach, 1950, Bull. Brooklyn Ent. Soc., 45: 53-55 [Type: ♀, GUATEMALA: Los Amates, 18 Febr. 1905 (J. S. Hine) (MCZ, no. 28, 385)]. New synonym.

This is the one of the more common and widely distributed members of the genus, and it is possible that other names will fall in the synonymy of *splendidulum*. I compared the types of *fragilis* and *torolae* directly, and while the type of *fragilis* is somewhat less extensively maculated with white than that of *torolae*, there seem to be no other differences. The genitalia of the type of *fragilis* are missing, but those of other Brazilian males do not differ noticeably from those

¹² I have not seen this type, but Dr. J. van der Vecht of Leiden, Netherlands, has kindly placed at my disposal some notes which he made regarding it. These notes leave little doubt that this is the species concerned.

of the type of *torolae*. *Priochilus splendidulum opacifrons* (Fox) (new status) is confined to Jamaica; the female averages smaller and has somewhat duller wings and a dull body which is not at all patterned with silvery pubescence.

Female. — Length 8-11 mm. Black; pubescence very fine, mostly brownish-fuscous to dark cinereous, except conspicuously silvery on the front, propleura, more or less of the coxae and lower pleura, usually the posterior part of the propodeum, and at least some evidence of banding on the abdomen. Fore wings with a broad, complete fuscous band over the basal and transverse median veins, a second broad band over the marginal and second and third SMCs, tending to fade out toward the hind wing margin, and a weak, narrow infuscation along the outer margin; where not banded the wing membrane tends to have a faint tinge of brownish by transmitted light, less evident in the area beyond SMC3; hind wing subhyaline, weakly infuscated apically. Clypeus and front with a few setae; temples, propleura, front coxae, and propodeum virtually devoid of setae; venter with some strong setae toward the apex, the apical tergite densely bristly. Mandibles with two small teeth along the inner margin. Clypeus 2.3-2.5 X as wide as high, its apical margin truncate, the margin polished, the polished area slightly widened medially. Head about 1.2 X as wide as high; front very narrow, MID .41-.49 X TFD; UID .80-.85 X MID, orbits diverging rather strongly below MID. Ocellar triangle compact, front angle less than a right angle; POL:OOL about as 3:5; ocelli rather small. Third antennal segment equal to from 1.1 to 1.3 X UID; vertex passing straight across between eye tops. Postnotum impressed medially and extending angularly backward on the midline. Propodeum smooth, without rugae. Hind tibiae with a series of small but clearly defined serrations on the upper surface, each serration terminating below in a small spine. Fore wing with the marginal cell long, removed from the wing tip by about .6 its own length; SMC2 not nearly as wide as the third, narrowed above by .5 to .8 of its width below by virtue of the fact that the first intercubital vein is strongly oblique, nearly straight; second submarginal cell not much if any wider than high; hind wing with the anal vein reaching median slightly before the origin of cubitus (fig. 11).

Description of type male of torolae. — Length 7 mm.; fore wing 6.5 mm. Black, except marked with white as follows: a pair of diagonal marks on the clypeus; posterior margin of pronotum; tibial spurs; a white spot on the outer side of the middle and hind tibiae near the base; broad basal bands on T2 & 3; and a spot on the apical tergite. Wings subhyaline, fore wing with an indistinct band at the basal vein and a more distinct band at and below the marginal cell; apex also weakly infuscated. Pubescence silvery over most of the body, conspicuously so on the pleura, coxae, and propodeum. Propodeum not hairy. Head about 1.2 X as wide as high. Clypeus 2.14 X as wide as high, truncate below. MID .54 X TFD, 1.25 X LID; UID 1.2 X LID; ocelli small, ocellar triangle compact, as in female, POL:OOL = 3:5. Third antennal seg-

ment 3.5 X as long as thick, equal to slightly over half UID, slightly longer than fourth segment. Vertex elevated in an even arc above the eye tops. Pronotum short, subangulate; postnotum produced backward medially, on the midline as long as the metanotum; propodeum with the slope low and even. Longer spur of hind tibia .65 X as long as basitarsus. Fore wing with the marginal cell .7 X its own length from the wing tip; SMC2 about as wide as high, narrowed by half above; SMC3 1.7 X as wide as high, narrowed by .4 above. SGP narrow, convex medially, covered with suberect setae and with the margin beset with strong spines (fig. 71). Genitalia with slender parameres possessing an oblique series of setae about midway and some fairly strong apical setae; digiti subacuate apically, with a rounded lobe on the inner margin, the setae small except for a few larger ones on the lobe; aedoeagus angularly produced on the sides toward the apex, the tip narrowly bilobed (fig. 31).

Distribution. — This species occurs throughout much of Brazil, west to Peru, north in the Lesser Antilles to St. Vincent and Dominica and in Central America to Guatemala. The Jamaica population (*splendidulum opacifrons*) doubtless reached there from Central America. (Map 29.)

Central American specimens examined. — 12 ♀♀, 14 ♂♂. PANAMA: 3 ♀♀, 4 ♂♂, Barro Colorado Isl., Jan.-Apr., Aug. (KWC, CWR) [USNM, MCZ, KU]; 2 ♂♂, Mojinge Swamp, Ft. Sherman, Canal Zone, 15 Aug. 1951 (F. S. Blanton) [USNM]. COSTA RICA: 3 ♀♀, 4 ♂♂, Turrialba, June-Aug. (KWC, CCP) [USNM, MCZ]; 2 ♀♀, 3 ♂♂, La Fortuna, Alajuela Prov., 18 Feb. 1964 (HEE) [MCZ]; 1 ♀, 12 mi. SW Cañas, Guanacaste Prov., 27 Feb. 1964 (HEE) [MCZ]; 2 ♀♀, 2 mi. NE Corredor, 20 Aug. 1957 (AM) [LACM]. GUATEMALA: 1 ♂, Torola, 1000 feet (GCC) [BMNH]; 1 ♀, Los Amates, 18 Febr. 1905 (J. S. Hine) [MCZ].

Variation. — The females from throughout the range show little variation other than slight differences in pattern of the wings and the body pubescence. The males range in size from 6 to 8.5 mm. and vary slightly in the same two factors, as well as more conspicuously in the pattern of whitish maculations. The majority of South American males have the white band on the pronotum absent or much reduced, while in all those from Central America it is well developed; there may be corresponding reductions in the markings on the abdomen and on the tibiae, although these maculations are never lost entirely. In one of the Barro Colorado males and the two from Fort Sherman (also one male from San Estaban, Venezuela) the clypeus



is wholly white except for a median streak and the front coxae are whitish in front; these specimens thus bear much resemblance to the male *scrupulum* (= *clarus* Banks), but they lack the white markings on the face and have terminalia typical of *splendidulum*. Otherwise, the males I have seen from both Central and South America lack white on the coxae and have only small white spots on the clypeus. There seems to be considerable variation in the shape and distribution of setae on the digiti of the genitalia, and it is conceivable that I may be grouping more than one species under the name *splendidulum*.

***Priochilus admirationis admirationis* (Cameron)**

Pompilus admirationis Cameron, 1893, Biol. Centr.-Amer., Hymen. II, p. 202 [Type: ♀, PANAMA: Volcan de Chiriqui, 2-3000 feet (GCC) (BMNH, no. 19, 713)]. — Dalla Torre, 1897, Cat. Hymen., VIII, p. 270.

Priochilus admirationis Dreisbach, 1950, Bull. Brooklyn Ent. Soc., 45: 55.

Priochilus amabilis Dreisbach, 1950, *ibid.*, p. 55 (Honduras).

This form differs but slightly (chiefly in the darker and less evidently banded wings) from *admirationis amabile* Banks (new status), described from Ecuador. The type of *admirationis* is in excellent condition and has both the middle and hind legs rufous basally, al-

though this is not clear from Cameron's description and Dreisbach assumed that only the hind legs were partly rufous. The male of typical *admirationis* is not known, but that of subspecies *amabile* is known from a topotypic paratype. This specimen has the legs colored as in the female except that the front femora are also rufous; the basal two segments of the abdomen are also largely rufo-castaneous; the subgenital plate is acutely pointed apically, the genitalia characterized by a small angular lobe midway on the parameres and by having the basal hooklets double. The male of *admirationis admirationis* should be easily recognized when discovered.

Description of type female. — Length 17 mm.; fore wing 14 mm. Black, except middle and hind coxae, trochanters, and femora bright rufo-castaneous; body pubescence wholly dark, obscurely violaceous; wings fuscous, slightly violaceous, fore wing somewhat darker in a band over the basal vein and a second obscure band in and below the marginal cell. A few erect hairs present on the clypeus, front, propleura, and front coxae; propodeum without setae; abdomen strongly setose ventrally and on the apical three tergites, the setae on the last tergite especially dense and bristly. Mandibles with two rather large teeth along the inner margin. Clypeus 2.1 X as wide as high, its apical margin subtruncate except for a weak median notch, the apical border broadly smooth and polished. Head 1.2 X as wide as high; front very narrow, MID .50 X TFD, .75 X eye height; UID about .8 X MID; eyes diverging rather strongly on the lower fourth. Ocelli rather large, in a compact triangle; POL: OOL = 10:13. First four antennal segments in a ratio of about 15:5:28:20, segment three equal to 1.5 X UID. Pronotum short, broadly angulate behind; postnotum slightly shorter than the metanotum; propodeum without rugae, with an impressed median line. Front tibiae with a number of spines and bristles above, toward the apex; hind tibiae with a weak carina above running for its entire length, somewhat irregular in profile and subserrate toward the base, but without small spines associated with carina. Fore wing with the marginal cell very long, separated from the wing tip by only about half its own length; SMC2 much wider than high, only slightly narrowed above; SMC3 very large, much wider below than the second; transverse median vein reaching media slightly beyond the origin of the basal vein; hind wing with the anal vein reaching media well before the origin of the cubital vein.

Male. — Unknown.

Distribution. — Panama to Honduras. (Map 30.)

Specimens examined. — 4 ♀♀. PANAMA: 1 ♀, Volcan de Chiriqui, 2-3000 feet (GCC) [type, BMNH]. COSTA RICA: 2 ♀♀, Ochomogo, 24 June 1936 (A. Alfaro) [MCZ]; 1 ♀, La Trinidad [CU]. HONDURAS: 1 ♀ [recorded by Dreisbach, 1950, without specific locality data].



Variation. — The three Costa Rica females are considerably larger than the type (18-20 mm.; fore wing 17-19 mm.). The third antennal segment is 1.65-1.70 X UID, POL and OOL subequal in all three specimens. The middle and hind legs of the Ochoмого specimens tend to be rather pale, almost yellow, but this may be a result of the fact that these specimens were mounted from alcohol. Otherwise these specimens resemble the type very closely.

Priochilus formosum hondurensis Dreisbach

Priochilus formosus var. *hondurensis* Dreisbach, 1950, Bull. Brooklyn Ent. Soc., 45: 51-53 [Type: ♀, HONDURAS: Lancitilla, 31 Oct. 1932 (Stadellmann) (MCZ, no. 28, 391)].

This form differs from the South American *formosum formosum* Banks in the same manner in which *admirationis admirationis* differs from *admirationis amabile*, namely, in having the wings more heavily infuscated and the banding somewhat obscured. Typical *formosum* is known from Peru, Ecuador, Brazil, and British Guiana. Both sub-species are known from females only.

Female. — Length 13-17.5 mm. Head, thorax, and appendages wholly

black, abdomen wholly bright rufo-castaneous except for the extreme base of the first segment, fore wings wholly infuscated, somewhat darker in a band across the basal and transverse median veins and in a second band at and below the marginal cell; hind wings lightly infuscated, dark at the apex. Pubescence very fine, dark over the head and thorax and pale on the abdomen; clypeus, front, vertex, and thoracic dorsum each with a few strong setae; propleura with fine setae; front coxae sparsely setose in front and behind; propodeum sometimes with a small amount of fine, inconspicuous hair; abdomen with strong, golden-brown setae ventrally and on the apical three tergites, those on the apical tergite dense and bristly. Mandibles with two teeth on the inner margin. Clypeus 2.0-2.2 X as wide as high, truncate, with a polished band along the margin. Head 1.24 X as wide as high; front narrow, MID .43-.46 X TFD; UID about .8 X MID. Eyes very prominent; ocelli somewhat enlarged, in a compact triangle, POL subequal to or slightly exceeding OOL. Antennae very elongate, segment three equal to 1.45-1.60 X UID. Pronotum short, very broadly angulate behind; postnotum finely striate, nearly as long as the metanotum; propodeum smooth except for a median impression. Hind tibiae with several rows of spines, also with a fairly strong, complete carina which is slightly serrate in profile, more strongly so toward the base, the serrations not bearing spines except the apical one to three with small spines. Fore wing with the marginal cell removed from the wing tip by about half its own length; SMC2 narrowed above by about .25-.35 X its width at the bottom; hind wing with the anal vein reaching media well before the origin of the cubitus.

Male. — Unknown.

Distribution. — Costa Rica to Honduras. (Map 30.)

Specimens examined. — 4 ♀ ♀. COSTA RICA: 2 ♀ ♀, Turrialba, June, July (HAS, KWC) [OSU, USNM]; 1 ♀, Pejivalle, about 2000 feet, 13 Aug. 1927 (Rehn) [ANSP]. HONDURAS: 1 ♀, Lancitilla [type, MCZ].

Priochilus fustiferum new species

Holotype. — ♂, PANAMA: Mojinga Swamp, Ft. Sherman, Canal Zone, 17 June 1952 (at light, D. & E. Thurman) [USNM].

This species bears a strong superficial resemblance to *gloriosum*, but the genitalia are quite different, the third antennal segment much shorter, the ocelli larger, and the postnotum of different form. It is presently known from the male sex only.

Description of type male. — Length 12.5 mm.; fore wing 11 mm. Black, except apical abdominal tergite with a white spot; wings hyaline, except fore

wing crossed by two broad, fuscous bands, one at the basal vein, the other filling most of the marginal cell and all of SMC2 and 3, barely reaching the lower wing margin. Pubescence silvery over much of the head and thorax, especially conspicuous on the clypeus, front, pleura, coxae and propodeum; abdomen silvery-pubescent except for inconspicuous apical dark bands on T2-4. Body largely without erect hairs except for a few on the front, vertex, and propodeum. Mandibles tridentate. Clypeus 1.9 X as wide as high, broadly truncate apically. Head 1.28 X as wide as high; front narrow, MID .49 X TFD; UID .96 X LID. Ocelli large, front and hind ocelli separated by much less than the diameter of an ocellus, lateral ocelli removed from eye margin by only 1.5 X their own diameters; POL:OOL about as 4:5. First four antennal segments in a ratio of about 23:7:37:38, segment three about 3.5 X as long as thick, equal to .92 X UID. Pronotum broadly subangulate behind; postnotum a transverse band two-thirds as wide as metanotum, not extended backward medially. Propodeum with the median line weakly impressed, the slope very low and even, with no evidence of rugae. Middle and hind tibiae with abundant strong spines; longer spur of hind tibia half the length of the basitarsus; claws of both middle and hind tarsi both nearly simple, with only a weak basal swelling on the long outer ray. Fore wing with the stigma very long, the marginal cell long, removed from the wing tip by only half its own length; SMC2 and 3 both wide, SMC2 1.55 X as wide as high, narrowed by .3 above; SMC3 1.5 X as wide as SMC2, 1.8 X as wide as its maximum height, narrowed by slightly less than half above. First abdominal segment slender. SGP tapering to a narrowly rounded apex, its median line strongly elevated (much as figured for *splendidulum*, but slightly wider). Genitalia with the parameres slender, strongly setose; digiti mostly covered with strongly clubbed setae; basal hooklets strongly doubled; aedeagus terminating in two slender lobes (fig. 33).

Distribution. — Venezuela to Costa Rica. (Map 31.)

Paratypes. — VENEZUELA: 1 ♂, San Estaban, Falcon, Dec. 1939 (P. J. Anduze) [CU]; COSTA RICA: 3 ♂♂, Turrialba, Aug. 1963 (CCP) [MCZ].

Variation. — In the paratypes LFW varies from 10 to 12 mm. There are no important differences from the type in structure, and the ratios expressed for the type apply equally well to the paratypes. The Turrialba specimens have the apical band on the fore wing very strong, filling nearly all of the marginal cell and broadly reaching the posterior wing margin, although less intense behind.

Priochilus gloriosum gloriosum (Cresson)

Pompilus gloriosus Cresson, 1869, Proc. Boston Soc. Nat. Hist., 12: 368 [Type:



♀, MEXICO: VERACRUZ: Orizaba (Sumichrast) (ANSP, no. 558)]. — Cameron, 1893, Biol. Centr.-Amer., Hymen. II, p. 201 (Guatemala, Panama). — Dalla Torre, 1897, Cat. Hymen., VIII, p. 292.

Priochilus gloriosus Bradley, 1944, Notulae Nat., Acad. Nat. Sci. Phila., no. 145, p. 6.

Priochilus nobilis Dreisbach, 1950, Bull. Brooklyn Ent. Soc., 45: 56-57 (misidentification, not *nobilis* Fabricius).

Although Dreisbach (1950) indicated that *gloriosum* lacks rugae on the propodeum and *nobilis* (i.e., *multifasciatum*, *nobilis* being pre-occupied) possesses them, actually the reverse is true. The two forms are indistinguishable except in this one character, but since this feature is used for separating species elsewhere in the genus, it seems desirable to grant *multifasciatum* subspecific status. Actually very indistinct rugae can be detected on the propodeum of some female *multifasciatum* from Brazil and Peru; the Venezuela females I have seen have very distinct rugae and are thus assignable to *gloriosum gloriosum*. The male of *gloriosum* also possesses weak rugae on the propodeum and is thus distinguishable from that of *multifasciatum*.

Female. — Length 14-19 mm. Entirely black, richly ornamented with glistening silvery pubescence, especially prominent on the head, coxae, lower mesopleura and upper metapleura, pronotum in front, on the sides, and be-

hind, posterior part of mesoscutum, sides of metanotum, propodeum at base and on the posterior slope, strong basal bands or paired spots on T1-3, also most of the venter and the apical tergites. Fore wings strongly twice-banded, also narrowly and weakly infuscated along the outer margin, clear hyaline between the bands; hind wings with a weak band in the middle as well as a banded tip. Head and thorax moderately hairy, the temples, prothorax, front coxae, and propodeum with abundant white hair; abdominal venter and apical tergites with strong, dark setae, the apical tergite with a dense covering of short bristles underlying the sparse, long setae. Mandibles fairly broad apically, the three strong teeth in an oblique apical series. Clypeus large and of unusual shape, 1.8-2.0 X as broad as high, its apical margin extended rectangularly forward, the extension truncate or weakly rounded, polished and devoid of setulae. Head 1.22 X as wide as high; front narrow, MID .44-.50 X TFD, eyes less convergent at the top than is usual in this genus, UID .85-.90 X MID; front rather sunken below the level of the large eyes. Ocelli not enlarged, in about a right triangle, POL:OOL about as 2:3 or 3:4. Third antennal segment equal to from 1.3 to 1.5 X UID. Pronotum subarcuate behind, slightly depressed medially; postnotum rather short but extended angularly backward medially; propodeum weakly impressed medially and with some distinct, irregular transverse rugae on its middle portion. Legs generally slightly less strongly spinose than in the preceding several species; hind tibiae with several rows of rather short spines, not serrate or carinate except very obscurely so. Fore wing with the stigma somewhat smaller than in the preceding several species, only very slightly longer than the height of the marginal cell, the latter long and removed from the wing tip by about half its own length; SMC2 wider than high, only slightly if at all narrowed above; hind wing with the anal vein approximately interstitial with the cubitus.

Male. — Length 13 mm. Coloration of body, wings, and pubescence essentially as in the female, except the apical abdominal tergite also in large part whitish; propodeum with fairly abundant whitish hairs; abdomen with rather abundant short, whitish hairs toward the apex in addition to the silvery pubescence. Mandibles strongly tridentate. Clypeus simple, the apex truncate, measuring about twice as wide as high. Head about 1.25 X as wide as high; MID .47 X TFD; UID .93 X LID; POL:OOL=5:7. First four antennal segments in a ratio of about 15:5:30:21, segment three nearly 7 X as long as its maximum width, equal to 1.25 X UID. Pronotum subarcuate behind; postnotum extended angularly backward medially; propodeal slope very low, the surface with some weak transverse rugae toward the middle. Hind tarsal claws with only a weak basal swelling; middle tarsal claws with a slightly stronger basal swelling, subdentate. Venation essentially as in female. SGP much as figured for *splendidulum* (fig. 31), but the apex slightly more broadly rounded, the disc strongly, roundly elevated; surface with short, white hairs except some longer and darker hairs apically. Genitalia with the parameres rodlike, bristly, in lateral view fairly broad, oblique subtruncate apically; basal

hooklets double; aedoeagus with a pair of long, slender apical processes (fig. 34).

Distribution. — Venezuela to southern Mexico. Dreisbach's record of *nobilis* from "Rio Punte in the Antilles" is actually based on a specimen of *gloriosum gloriosum* in the MCZ from Rio Puente, Panama. *P. gloriosum multifasciatum* Taschenberg, 1869, of which *cosmopteryx* Cameron is a synonym, ranges from Trinidad, Pará, and Matto Grosso to Bolivia and Peru. (Map 30.)

Specimens examined. — 20 ♀♀, 2 ♂♂. VENEZUELA: 2 ♀♀, San Estaban, Falcon, Dec.-Jan. (P. J. Anduze) [CU, MCZ]; 1 ♀, Los Canales, Naiguata, D. F., Sept. (Vivas-Bethier) [CU]. PANAMA: 2 ♀♀, Bugaba, 800-1000 feet (GCC) [BMNH]; 1 ♀, Rio Puente, Colon Prov., 1940 (G. Fairchild) [MCZ]; 1 ♀, Las Cumbres, Panama Prov., Dec. 1962 (G. Fairchild) [MCZ]; 1 ♀, 1 ♂, Trinidad Rio, 20 Mch. 1912 (A. Busck) [USNM]; 1 ♀, Gatun, Canal Zone (A. H. Jennings) [USNM]; 1 ♀, Porto Bello, 18 Apr. 1912 [USNM]; 1 ♀, 1 ♂, Barro Colorado Island, Canal Zone, Mch., Apr. [USNM]; 1 ♀, France Field, June [CU]. GUATEMALA: 1 ♀, Chiacaman, Vera Paz (GCC) [BMNH]; 2 ♀♀, Santa Lucia, 2 Feb. 1905 (J. S. Hine) [Ohio State Univ.]. MEXICO: VERACRUZ: 1 ♀, Orizaba [type, ANSP]; 1 ♀, Teocelo [USNM]; 1 ♀, Presidio [CU]; 2 ♀♀, Atoyac, May (HHS) [BMNH].

Variation. — The specimen from Las Cumbres, Panama, has very weak rugae on the propodeum.

Priochilus veraepacis (Cameron) new combination

Pompilus veraepacis Cameron, 1893, Biol. Centr.-Amer., Hymen, II, p. 200, pl. 11, figs. 21 & 21a [Type: ♂, PANAMA: Volcan de Chiriqui, below 4000 feet (GCC) (BMNH, no. 19, 723)]. — Dalla Torre, 1897, Cat. Hymen., VIII, p. 332.

Priochilus superbus Banks, 1944, Zoologica, 29: 105 [Type: ♀, BRITISH GUIANA: Kamakusa, Sept. 1922 (H. Lang) (MCZ, no. 26, 185)]. — Banks, 1946, Bull. Mus. Comp. Zool., 96: 513. New synonym.

Priochilus regius Dreisbach, 1950, Bull. Brooklyn Ent. Soc., 45: 57, 59 (Panama) (misidentification, not *regius* Fabricius).

This species is very closely related to *regius* Fabricius, even the male terminalia being virtually identical. However, the characters presented by Banks (1946) seem to me to provide a valid means of

separation; the shape of SMC2 and of the mesopleura will work for both sexes. Cameron named this species for the district of Vera Paz, in Guatemala, and perhaps his female, from that locality, should be regarded as the type rather than the male from Panama. In any case the two appear to me conspecific.

Female. — Length 12-21 mm. (most specimens 14-17 mm.). Body and appendages black; fore wing wholly infuscated, occasionally obscurely twice-banded, strongly violaceous; hind wing typically strongly infuscated apically and along the anterior margin, clear hyaline basally and posteriorly (extent of the hyaline part very variable). Pubescence dense and brilliantly silvery on the following parts: head except vertex; pronotum, coxae, and lower pleura in considerable part; metanotum on the sides; and practically the entire propodeum; femora and tibiae with somewhat finer silvery pubescence, also the abdomen (except T2 and 3, sometimes 1, with dark pubescence apically). Head and thorax with a considerable amount of white, erect hair, the propodeum wholly covered with white hair; scutellar disc with a few dark setae; abdomen with dark setae ventrally and apically, those on the apical tergite quite dense and most of them appressed, directed backward. Mandibles with one large tooth in addition to the apical tooth. Clypeus about 2.4 X as wide as high, its apical margin weakly, evenly concave. Head about 1.25 X as wide as high; front narrow, MID .45-.50 X TFD; eyes slightly convergent at the top, UID .85-.90 X MID, divergent below the middle. Ocelli small, in a compact triangle, POL:OOL about as 2:3. Third antennal segment equal to from 1.15 to 1.30 X UID. Pronotum arcuate or weakly subangulate behind; postnotum a transverse band not nearly as wide as the metanotum; propodeum sloping roundly, without transverse rugae or a well impressed median line. Mesopleura with a cone-shaped process directly in front of the middle coxa. Hind tibiae with several rows of relatively short spines, also with a strong, complete carina which is without spines but rather strongly undulate in profile, toward the base rather distinctly serrate. Fore wing with the marginal cell very long, removed from the wing tip by only about half its own length; stigma small, not longer than the height of the marginal cell; SMC2 large, more than 1.5 X as wide as high, narrowed by only about .2 above.

Male. — Length 13-15 mm. Coloration of body and wings as described for female; pubescence also essentially the same as in that sex, the propodeum wholly and very conspicuously covered with silvery pubescence; head, prothorax, and propodeum with a considerable amount of fine, white hair. Mandibles slender, with a single small tooth along the inner margin in addition to the apical tooth. Clypeus 2.1 X as wide as high, its apical margin weakly concave. Head 1.26 X as wide as high; MID .48-.50 X TFD; UID about .9 X LID; OOL considerably exceeding POL. Third antennal segment somewhat longer than fourth segment, about 4.5 X as long as thick. Pronotum short, subangulate behind; postnotum about two thirds as long as the metanotum;

propodeum with the slope very low, the median line not impressed. Mesopleura produced as a cone in front of the middle coxae. Middle and hind tarsal claws with only a small basal swelling. Venation as in female, the SMC2 tending to be smaller, about 1.5 X as wide as high. SGP tapering to a narrowly rounded apex, roundly elevated medially, at the base on each side somewhat angularly produced (the plate much as figured for the following species, *captivum*). Genitalia closely resembling those of *captivum*, but the basal hooklets distinctly double, the apical processes of the aedoeagus shaped somewhat like bird's heads, the "beaks" sharply pointed.¹³

Distribution. — Brazil and Bolivia to the Guianas and to Costa Rica, with one record from Guatemala. (Map 29.)

Central American specimens examined. — 3 ♀ ♀, 1 ♂. PANAMA: 1 ♂, Volcan de Chiriqui [type, BMNH]; 1 ♀, Barro Colorado Isl., 26 July 1956 (CWR) [KU]; also recorded by Dreisbach, 1950, from Progreso, Chiriqui Prov. (♀, under the name *regius*). COSTA RICA: 1 ♀, Piedras Negras (Schild & Burgdorf) [USNM]. GUATEMALA: 1 ♀, Cubilquitz, Vera Paz (GCC) [BMNH].

Priochilus captivum (Fabricius) new combination.

Pompilus captivus Fabricius, 1804, Syst. Piezatorum, p. 199 [Type: ♀ "AMERICA MERIDIONALIS" (?Brit. Guiana) (Copenhagen Mus.)].¹⁴
— Jurine, 1807, Nouv. Méth. Class. Hymen., p. 122.

Agenia captiva Dahlbom, 1843, Hymen. Eur. I, p. 456.

Pseudagenia captiva Kohl, 1884, Verh. Zool.-bot. Ges. Wien, 34: 42. — Dalla Torre, 1897, Cat. Hymen., 8: 199.

Pompilus vitabilis Smith, 1873, Ann. Mag. Nat. Hist., (4)11: 444 [Type: ♀, BRAZIL: Pará (BMNH, no. 19, 711)]. — Dalla Torre, 1897, Cat. Hymen., VIII, p. 335. New synonym.

Pompilus rhomboideus Fox, 1897, Proc. Acad. Nat. Sci. Phila., 49: 250-251 [Type: ♀, BRAZIL: Santarem, Febr. (CM)]. New synonym.

Pompilus demerarensis Cameron, 1912, Jour. R. Agri. Soc. Demerara, 2: 421 [Type: ♀, BRITISH GUIANA: Demerara (BMNH, no. 19, 698)]. New synonym.

Priochilus rhomboideus Banks, 1944, Zoologica, 29: 105. — Banks, 1946, Bull. Mus. Comp. Zool., 96: 514. — Dreisbach, 1950, Bull. Brooklyn Ent. Soc., 45: 58.

¹³ Description of male drawn from the type and a male from Belem, Brazil, the only two males I have seen; the genitalia of the type were not studied, and this part of the description is therefore based entirely on the Belem specimen.

¹⁴ I have not seen this type. Dr. J. van der Vecht has studied it and found it to be a *Priochilus*. There seems little question that it is conspecific with the species usually called *rhomboideus* Fox.

Acanthagenia excisa Haupt, 1959, Nova Acta Leopoldina, v. 21, no. 141, p. 65 [Type: ♀, SURINAM (C. Bollow) (Univ. Halle, Germany; not seen by writer)]. New synonym.

Female. — Length 7-11 mm. Entirely black; pubescence with moderately strong bluish reflections, generally silvery on the head (except the vertex), occasionally also on the coxae, lower pleura, and the abdomen; wings wholly infuscated, with or without evidence of darker banding, strongly violaceous. Head, prothorax, and propodeum with rather abundant dark hair; front coxae hairy, the other coxae usually weakly so; abdomen setose ventrally and apically, the apical tergite with sparse long setae and dense, recumbent spines which are directed caudad. Mandibles rather slender, with a single rather strong tooth in addition to the apical tooth. Clypeus about 2.3-2.5 X as wide as its median height, the margin rather strongly arcuate excised medially. Head very wide, TFD about 1.3 X VFD; front not strongly depressed below the level of the eyes. Inner orbits subparallel, UID subequal to LID, .85-.90 X MID; MID .47-.52 X TFD. Ocelli small, in a compact triangle, POL:OOL about as 2:3. Third antennal segment equal to from .90-1.10 X UID. Pronotum very broadly angulate behind; postnotum a transverse band somewhat shorter than the metanotum; propodeum with a high, rounded slope, without rugae or a well-defined median groove. Tibiae moderately spinose; hind tibiae with several rows of spines and also with a nearly complete carina on the outer side, the carina at most weakly sinuate in profile, bearing some very small spines at least toward the apex. Fore wing with the stigma about as long as the marginal cell is high; marginal cell removed from wing tip by .6-.8 its own length; SMC2 slightly wider than high, narrowed by usually about .2 above; hind wing with the anal vein interstitial with the cubitus or nearly so.

Male. — Length 7-10 mm. Coloration as in female; wings infuscated as in that sex, sometimes with banding faintly indicated; erect hairs as in the female except abdomen without long hairs. Head about 1.3 X as wide as high; clypeus 2.3-2.5 X as wide as high; front narrow, MID .48-.55 X TFD; inner orbits subparallel. Ocelli not enlarged, in a compact triangle; POL:OOL about as 7:11. Third antennal segment between 3 and 4 X as long as thick, subequal to or slightly longer than fourth segment. Pronotum broadly subangulate behind; slope of propodeum much lower than in female; tarsal claws as in the preceding species. Venation as in female except SMC2 often only slightly if at all wider than high. SGP tapering to a narrowly rounded apex, the sides at the extreme base angularly produced (fig. 73). Genitalia with the parameres unusually thick, excised on the dorsal side subapically, the apex strongly setose; basal hooklets with a broad edge but only one hook-like projection; aedoeagus terminating in a pair of slender lobes which are directed laterad (fig. 35).

Distribution. — Bolivia and Brazil to Trinidad and to southern Costa Rica. Dreisbach reports this species from "Flamenco, an island

in the Antilles", but the specimens referred to are clearly marked C. Z. (i.e., Canal Zone, Flamenco Island being just off Balboa). (Map 31.)

Central American specimens examined. — 22 ♀♀, 4 ♂♂. PANAMA: 1 ♂, Canal Zone (R. H. Arnett) [MCZ]; 1 ♀, Pr. Arraijan, June 1953 (F. S. Blanton) [USNM]; 1 ♀, Barro Colorado Isl., 28 Dec. 1948 (KWC) [USNM]; 2 ♀♀, Flamenco Isl., 15 Sept. 1924 (J. Zetek) [MCZ]; 14 ♀♀, 1 ♂, Taboga I., Febr. 1912 (A. Busck) [USNM]; 1 ♂, Corozal, Mch. 1912 (A. Busck) [USNM]. COSTA RICA: 1 ♀, Golfito, 28 July 1957 (AM) [LACM]; 2 ♀♀, Coto, June, Aug. (AM, J. O. Harrison) [LACM, Coll. Harrison]; 1 ♀, 5 mi. SW Santa Clara de San Carlos, Alajuela Prov., 19 Feb. 1964, about 400 ft. elev. (HEE) [MCZ]; 1 ♂, Turrialba, 22 July 1963 (HAS) [OSU].

Genus **BALBOANA** Banks

Balboa Banks, 1925, Bull. Mus. Comp. Zool., 67: 336 [Type species: *Priocnemis barbouri* Banks (= *auripennis* Fabr.), monobasic]. Preoccupied by Distant, 1893.

Balboana Banks, 1944, Zoologica, 29: 102, 103-104 (new name for *Balboa*, preoccupied). — Banks, 1946, Bull. Mus. Comp. Zool., 96: 506-510 (South American spp.). — Pate, 1946, Trans. Amer. Ent. Soc., 72: 77.

Generic characters. — Small to large wasps (5-23 mm.), the wings banded in all known species. Mandibles slender and rather straight, crossing each other, with a single tooth on the inner margin besides the apical tooth; labrum well exerted, more or less semicircular, with or without an apical emargination; malar space absent; clypeus a transverse band not wider than lower front; front narrow, with a median elevation just above the antennal sockets, this elevation bearing a median linear streak; temples not strongly developed, vertex not elevated much if any above eye tops; antennae of female slender basally, but with the outer flagellar segments rather short and thick; antennae of male with some of the flagellar segments produced beneath. Pronotum longer than in *Priochilus* and with its disc slightly, angularly produced anteriorly, so that the anterior face is at a strong angle with the disc (less distinct in male); postnotum a transverse band of moderate width; propodeum rather elongate, in the male with the slope low and even, in the female sloping but slightly in front, on the posterior third with an oblique declivity, the surface rugose on the upper part of the declivity. Legs weakly to rather strongly spinose, but the tibiae with at least a few apical spines which are at least slightly splayed-out; males with small spines on the outer part of the middle and hind femora;

hind tibiae of female not carinate or serrate; legs of male with bristling pubescence, as in *Priochilus*; last segment of front tarsus simple; all claws of both sexes bifid, the inner ray thicker than the outer; ultimate tarsal segments not spined beneath. Fore wing with the marginal cell long, rather acute apically; three SMCs present; basal vein arising very slightly basad of transverse median vein; hind wing with the transverse median vein leaving the anal vein at a slight angle, arching up to meet the median vein well before the origin of cubitus (fig. 12). Abdomen of female fusiform-cylindrical, not especially slender basally but more or less compressed apically; S2 without a transverse groove. Abdomen of male slender basally and strongly compressed apically; genitalia without basal hooklets, the aedoeagus small, exceeded by the straight, rod-like parameres and parapenial lobes; digiti slender, strap-shaped (figs. 61, 62).

Distribution. — This genus is confined to the tropical parts of America, ranging from southern Brazil and Bolivia north to Trinidad and to Mexico.

Remarks. — Aside from the type, none of the species of this genus are well known. In South America, the genus includes *manifestata* Smith, from the Amazon, four species described by Banks (1944, 1946), and the type species, *auripennis* Fabricius, which also enters Panama. There are four additional species in Central America.

Priochilus fraternus Banks, 1946, from Ecuador, is essentially *Balboana* with slender antennae like *Priochilus*; it is here transferred to *Balboana* (new combination). The two genera are obviously closely related and in the final analysis may not be clearly separable.

Key to Species

Females

1. Wings strongly tinged with yellowish; labrum strongly exserted, truncate or very shallowly emarginate apically; stigma shorter than below, roughly a third as long as the marginal cell; hind tibiae with several rows of strong spines *auripennis* (Fabricius)
- Wings not strongly tinged with yellowish; labrum partially exserted, with a broadly V-shaped emargination; stigma large, nearly or quite half as long as marginal cell 2
2. Clypeus and basal parts of legs blackish; SMC2 and 3 not unusually small, distance from third intercubital vein to tip of marginal cell slightly less than the distance from that vein to the stigma; clypeus not nearly as wide as lower face *tarsalis* (Cameron)
- Clypeus suffused with rufous; coxae, trochanters, and femora in large part

- or wholly rufous; SMC2 and 3 unusually small, distance from third intercubital vein to tip of marginal cell 1.1-1.5 X distance from that vein to stigma 3
3. Fore wing with the anal cell hyaline except on the apical .4, the outer two-thirds of the wing mostly fuscous except for three large whitish-hyaline spots which incompletely divide it into four bands; antennae slender, segment nine more than .6 as long as segment three; front narrow, MID .46 X TFD *pulchella* n. sp.
- Fore wing with the anal cell infuscated on the basal half as well as the apical .4; fore wing otherwise with two strong fuscous bands and a narrowly fuscous apical margin; antennae shorter and thicker apically, segment nine a third to a half as long as third segment; front broader, MID .49-.55 X TFD 4
4. Basal band of fore wing with an extension which fills the basal half of SMC1; hind tibiae without spines on the upper surface except for one or two minute ones; POL exceeding OOL about as 5:4 *cameroni* n. sp.
- Basal band of fore wing barely entering SMC1; hind tibiae with a row of five fairly strong spines above; POL and OOL subequal; pleura and propodeum partially suffused with ferruginous *nayaritana* n. sp.

Males

1. Wings strongly tinged with yellowish; stigma about a third as long as marginal cell; antennae strongly crenulate beyond segment four *auripennis* (Fabricius)
- Wings hyaline except for the usual banding; stigma about half as long as marginal cell; antennae crenulate only beyond segment six; coxae and femora reddish-brown *cameroni* n. sp.

Balboana auripennis (Fabricius)

Pompilus auripennis Fabricius, 1804, Syst. Piezatorum, p. 192 [Type: ♀, AMERICA MERIDIONALIS (location not known to writer)]. — Fox, 1897, Proc. Acad. Nat. Sci. Phila., 49: 258 (Brazil).

Pompilus chiriquensis Cameron, 1893, Biol. Centr.-Amer., Hymen, II, p. 201, pl. XI, fig. 22 [Type: ♀, PANAMA: Bugaba, 800-1500 feet (GCC) (BMNH, no. 19, 718)]. — Dalla Torre, 1897, Cat. Hymen., 8: 279. New synonym.

Pompilus aureipennis Dalla Torre, 1897, Cat. Hymen., 8: 275.

Pompilus moorei Cameron, 1912, Jour. R. Agri. Soc. Demerara, 2: 424 [Type: ♀, BRITISH GUIANA: Demerara (BMNH)]. Synonymy by Banks, 1944, confirmed by present writer.

Priocnemis (*Balboa*) *barboursi* Banks, 1925, Bull. Mus. Comp. Zool., 67: 333 [Type: ♀, PANAMA (no further data) (T. Barbour) (MCZ, no. 15, 344)]. New synonym.

Balboana auripennis Banks, 1944, Zoologica, 29: 104 (British Guiana).—
Banks, 1946, Bull. Mus. Comp. Zool., 96: 509 (Ecuador, British
Guiana).

Female. — Length 13-23 mm. Black, except femora dark brown above; pubescence varying in color from silvery through golden to brownish-violet, tending to be most conspicuous and of a pale golden coloration on the front, basal parts of the antennae, sides of metanotum, and base and apex of propodeum; pleura and basal parts of legs with pale golden to silvery pubescence; abdomen with pale golden to silvery pubescence except for apical bands on T1-4, where the pubescence is dark. Wings bright yellow, the hind wings tipped with fuscous, the fore wings a narrow apical fuscous band and two broader fuscous bands, one crossing the wing at the basal vein, the other at the second and third SMCs. Mandibles, labrum, and upper front with a few strong setae, the abdomen with numerous erect setae toward the apex, body otherwise smooth and without setae. Labrum strongly exerted, truncate or shallowly emarginate apically. Clypeus a transverse band about 2.8 X as wide as high, depressed on the extreme sides, the median portion very broadly subangulate at the margin, the midpoint rounded or weakly produced. Head about 1.2 X as wide as high; front narrow, MID .47-.52 X TFD; UID .75-.85 X MID, orbits diverging slightly below the middle. Ocelli rather large, POL and OOL subequal, or either may be slightly greater. Third antennal segment about 5 X as long as its apical width, equal to from 1.25 to 1.55 X UID; ninth antennal segment less than half the length of the third, but thicker, measuring about twice as long as thick. Pronotum subangulate behind, with a faint median impression. Propodeum with a faint median impression and some fairly strong transverse rugae, especially at the margin of the declivity; anterior part rather flat, in profile, the declivity strongly defined and oblique. Middle and hind tibiae with numerous spines in longitudinal rows, apically with a rim of spines which tend to be only slightly splayed-out and only slightly unequal in length. Fore wing with the marginal cell removed from the wing tip by only about .6 its own length; SMC2 rhomboidal, slightly wider than high, SMC3 wider than second, narrowed by a third to a half above (fig. 12). Abdomen rather strongly compressed apically.

Male. — Length 11-14 mm. Black, marked with whitish on the sides of the clypeus and lower front, the outer side of the front tibiae, the tibial spurs, the basal third of the first abdominal segment and a large spot on the apical tergite; antennal segments 3-7 strongly suffused with rufo-castaneous below; wings colored as in female. Pubescence largely pale, silvery to pale golden, the patterning much as in the female, the propodeum with much semierect silvery to pale golden pubescence on the posterior two-thirds. Labrum as in female; clypeus simple, broadly truncate apically, 2.2 X as wide as high. Head 1.24 X as wide as high; front narrow, MID roughly half TFD; UID very slightly less than LID; ocelli rather large, POL equal to or slightly exceeding OOL. First four antennal segments in a ratio of about 6:2:8:7, segment three



2.3 X as long as wide; segments four and beyond roundly produced below, 7-11 especially so, almost subangular. Postnotum angularly produced backward medially; propodeum with the slope very low and even; median line of propodeum impressed, but disc without rugae. Legs strongly spinose. Wing venation as in female. Abdomen slender at base, apical part strongly compressed, especially the SGP, which has the median line folded, the two sides pressed against one another; when flattened out on a slide, the sides of the SGP are seen to be angulate toward the base. Genitalia as described under the generic heading and as shown in fig. 61.

Distribution. — Brazil and Ecuador to the Guianas and Panama. (Map 32.)

Central American specimens examined. — 8 ♀♀, 6 ♂♂. PANAMA: 6 ♀♀, 6 ♂♂, Barro Colorado Island, Canal Zone, Jan.-July, Dec. (CWR, NB, Zetek, Lutz, Curran) [USNM, MCZ, KU]; 1 ♀, no further data (T. Barbour) [MCZ]; 1 ♀, Bugaba, 800-1500 feet (GCC) [BMNH].

Balboana tarsalis (Cameron) new combination

Pseudagenia tarsalis Cameron, 1897, Ann. Mag. Nat. Hist., (6)19: 372 [Type: ♀, GUATEMALA: Purula, Vera Paz (GCC) (location unknown; there are two females with identical data in the BMNH)]. — Cameron, 1899, Biol. Centr.-Amer., Hymen. II, Suppl., p. 403.

This species runs to *nigrina* Banks, described from southern Brazil, in Banks' key to the South American species (1946). It is, in fact, very similar to that species in size, color, and most structural features, but the middle and hind tibiae are nearly devoid of spines on the upper surface and the wing pattern is slightly different.

Description of topotypic female.—Length 12 mm.; fore wing 10 mm. Black; antennae light brown on the inner side of segments 3-5; tibial spurs straw-colored except infuscated basally; all tarsi dusky rufo-castaneous. Body clothed with pubescence which is generally silvery, but with golden reflections on parts of the dorsum; silvery pubescence of coxae, pleura, and posterior half of propodeum especially dense; propodeum with a few erect hairs on the lower sides; abdomen short-setose ventrally and apically. Hind wings clear hyaline; fore wings hyaline, slightly opaque and milky, banded with brown as follows: central part of anal cell, a broad band over the basal and transverse median veins and into the apical part of the anal cell (separated from the marking in the central part of the cell), a broad band over the basal two-thirds of the marginal cell and SMCs 2 and 3, not quite reaching the outer or lower wing margin, and a lightly indicated and narrow band along the outer wing margin. Labrum partially exerted, with a broadly V-shaped apical emargination. Clypeus narrower than lower front, measuring 2.7 X as wide as high, broadly truncate medially, slightly depressed and contracted on the extreme sides. Head 1.2 X as wide as high; MID .52 X TFD; UID .80 X LID, .82 X MID; ocelli not enlarged, POL and OOL subequal. Third antennal segment 5 X as long as its apical thickness, equal in length to UID; ninth antennal segment about twice as long as thick, less than half the length of the third. Pronotum broadly angulate behind. Propodeum shorter and more rounded than in *auripennis*, with strong rugae much as in that species. Middle and hind tibiae very weakly spinose, the hind tibiae with only some very thin, hair-like spines on the upper surface, the apex with only two or three thin spines. Fore wing with the marginal cell removed from the wing tip by .6 its own length; stigma large, nearly half as long as marginal cell; basal and transverse median veins interstitial; SMC2 small, rhomboidal, about 1.25 X as wide as high; SMC3 larger, 1.5 X as wide as high, 1.5 X as wide as SMC2, narrowed by slightly less than half above; distance from third intercubital vein to tip of marginal cell slightly less than distance from that vein to stigma (measured along radial vein). Abdomen moderately compressed apically.

Male. — Unknown.

Distribution. — Known only from the type locality. (Map 32.)

Specimens examined. — 2 ♀♀. GUATEMALA: 2 ♀♀, data as cited for holotype [BMNH].

Variation. — The second female is very similar and standard measurements are virtually identical to those cited above. However, the antennae are somewhat different colored, segments 4-6 being wholly rufo-testaceous, segment three of this color toward the apex.

Balboana cameroni new species

Holotype. — ♀, COSTA RICA: Turrialba, 31 May 1944 (F. Schrader) [USNM].

A specimen of this species from Volcan de Chiriqui, Panama (GCC), is labeled "*Pseudogenia hecuba* Cam.", but so far as I can determine Cameron never actually described such a species. This species is of about the same size and general appearance as the preceding, but there are enough differences in color, wing venation, and shape of the propodeum to convince me that each deserves specific status.

Description of type female. — Length 13 mm.; fore wing 10.5 mm. Black, marked with ferruginous as follows: antennal segments 4-6 and apex of 3; greater part of clypeus; labrum, mandibles, and palpi; legs, including all coxae, except tibiae and tarsi darker, suffused with fuscous; spurs straw-colored; extreme tip of abdomen weakly suffused with rufous. Pubescence in large part silvery, especially dense and conspicuous on the lower pleura, posterior half of propodeum, and basal portions of abdominal segments; on the vertex, thoracic dorsum, and apices of basal abdominal terga, the pubescence is brownish; front coxae and propodeum with only some very fine, short, pale setae. Hind wings hyaline except the tip weakly infuscated; fore wings hyaline, with a strong whitish spot just outside SMC3, banded with brownish as follows: basal half and apical .4 of anal cell; a broad band across the transverse median and basal veins, extending to fill the basal half of SMC1; a small spot at apex of second discoidal cell; a broad band filling the basal two-thirds of the marginal cell, SMCs 2 and 3, and the outer half of the third discoidal cells, more or less confluent with a weaker band filling the space beyond the third discoidal cell and extending along the outer wing margin. Labrum partially exerted, with a broadly V-shaped apical emargination. Clypeus about as wide as lower front, narrowly separated from the margins on each side, measuring 2.6 X as wide as high, the apical margin broadly truncate, slightly depressed and contracted on the sides. Head 1.15 X as wide as high; MID .50 X TFD; UID .73 X LID, .78 X MID; POL:OOL = 5:4. Third antennal segment 4 X as long as its apical thickness, subequal in length to UID; ninth antennal segment about twice as long as thick, about half the length of the third. Pronotum broadly subangulate behind. Propodeum rather flat in front, with an abrupt, oblique declivity on the posterior third, with some fairly strong rugae on the margin

of the declivity. Middle and hind tibiae with the spines short and sparse, the upper surface of the hind tibiae with very scattered, minute spines. Marginal cell rather pointed, removed from wing tip by only slightly more than half its own length; stigma .47 X as long as marginal cell; basal vein arising from media slightly basad of junction of transverse median vein; SMC2 small, only slightly wider than high; SMC3 also small, much wider below than second but not wider on the radial vein than SMC2; distance from third intercubital vein to tip of marginal cell 1.25 X distance from that vein to stigma. Abdomen weakly compressed apically.

Allotype. — ♂, COSTA RICA: Turrialba, Aug. 1963 (CCP) [MCZ].

Description of allotype male. — Length 6 mm.; fore wing 6 mm. Body black, the following parts whitish: apical third of clypeus, lower inner orbits, posterior margin of pronotum, a large spot on apical tergite; labrum and mandibles largely testaceous; antennae pale ferruginous on basal half, deeply infuscated beyond segment six; legs dusky ferruginous, including all coxae, except middle and hind tibiae and tarsi moderately infuscated; tibial spurs white and hind tibiae with a small basal white spot. Wings hyaline, fore wing with a brownish band across the basal and transverse median veins and a broader band filling the marginal cell and extending to the lower wing margin, where it meets a weaker band along the outer margin. Body pubescence coarse, whitish; erect hairs of head and thorax very short, pale, inconspicuous. Labrum with a median notch; clypeus broadly truncate, 2.4 X as wide as high. Head 1.2 X as wide as high, the vertex smoothly arcuate; MID .52 X TFD; UID very slightly exceeding LID; POL:OOL = 3:2. First four antennal segments in a ratio of 15:5:20:17, segment three about 3 X as long as thick; segments 3-5 are slender, unmodified, segments 6-9 and also 12 are somewhat rounded below, segments 10 and 11 are more strongly produced below and each bears a conspicuous sensorium on the apical third. Postnotum a transverse band which is not produced backward medially; propodeum with a strong median impression. Legs rather weakly spinose; longer spur of hind tibia nearly as long as basitarsus. Fore wing as described for the female except SMC3 slightly wider on the radial vein than SMC2, distance from third intercubital vein to tip of marginal cell slightly less than distance from that vein to stigma. Abdomen strongly compressed; SGP very slender and pointed, its sides not expanded at the base (fig. 74). Genitalia as shown in fig. 62, differing from those of *auripennis* especially in having the apical part of the digiti devoid of setae.

Distribution. — Costa Rica and western Panama. (Map 32.)

Paratypes. — COSTA RICA: 1 ♀, same data as type except 14 May 1944 [MCZ]. PANAMA: 1 ♀, Volcan de Chiriqui, 2000-3000 feet (GCC) [BMNH].

Variation. — The second Turrialba specimen is smaller than the type (fore wing 8.5 mm.) and has the front very narrow, MID .49 X TFD; it is otherwise very similar to the type. The Chiriqui female has the fore wing 9.5 mm. long, the front somewhat broader, MID .52 X TFD; in this specimen antennal segment three measures 1.1 X UID and is more than twice the length of segment nine; aside from some minor deviations from the wing pattern of the type, there are no noticeable color differences.

Balboana nayaritana new species

Holotype. — ♀, MEXICO: NAYARIT: Vic. Compostela, July 1934 [MCZ, no. 30, 965].

This species is known from a single specimen from a locality far north of the nearest other records for the genus. (Map 32.)

Description of type female. — Length 12 mm.; fore wing 9 mm. Black, marked with ferruginous as follows: antennal segments 4-6 and adjacent parts of 3 and 7; ventral side of scape; entire clypeus, labrum, and mandibles (rest of mouthparts straw-colored); legs in their entirety except front and middle tibiae dusky above (spurs straw-colored); lower third of mesopleura; a spot on the upper metapleura; a broad streak on each side of the propodeum; apical third of abdomen suffused with ferruginous. Pubescence pale, grading into golden-brown on the dorsum, especially dense on the propodeum and lower pleura; front coxae and propodeum without erect hairs except for some extremely short ones. Hind wings subhyaline; fore wings subhyaline, banded with brownish as follows: most of basal half and apical .4 of anal cell; a broad band across the basal and transverse median veins, not extending into SMC1; a small spot at apex of second discoidal cell; a broad band filling the basal two-thirds of the marginal cell, SMC2 and 3, and extending obliquely outward to join a weaker band along the outer wing margin. Labrum with a broadly V-shaped apical emargination. Clypeus 2.8 X as broad as high, its apex broadly truncate, its sides separated from the lower eye margins by a distance slightly greater than the malar space. Head 1.15 X as wide as high; front broad for the genus, but the eyes strongly convergent above; MID .55 X TFD; UID .75 X LID; POL and OOL subequal. Third antennal segment 5 X as long as its apical width, 1.15 X UID; ninth segment slightly less than twice as long as thick, only a third the length of third segment. Pronotum broadly subangulate behind. Propodeum sloping but weakly in front, with an oblique posterior declivity, greater part of the surface covered with transverse rugae. Tibiae somewhat more strongly spinose than in the preceding two species, the hind tibiae with a row of five fairly strong spines above, three fairly strong, splayed-out apical spines. Marginal cell removed from wing tip by .6 its own

length; distance from third intercubital vein to tip of marginal cell 1.2 X distance from that vein to stigma; SMC2 1.2 X as wide as high; SMC3 slightly wider below than second, but not as wide above; basal vein arising on media distinctly basad of transverse median vein. Tip of abdomen rather strongly compressed, especially ventrally.

Balboana pulchella new species

Holotype. — ♀, PANAMA: Barro Colorado Island, Canal Zone, 15 Feb. 1956 (C. W. & M. E. Rettenmeyer) [USNM].

In Banks' (1946) key to the South American species, this form runs to *fulvipes* Banks, from British Guiana and Trinidad. It is, in fact, very similar to that species, differing chiefly in wing pattern and in the more slender antennae. The antennae are nearly as elongate as in *fraternus* Banks, a much larger species described from Ecuador.

Description of type female. — Length 8 mm.; fore wing 6.5 mm. Black, marked with ferruginous as follows: antennal segments 5 and 6 and adjacent parts of 4 and 7; clypeus, labrum, and mouthparts (mainly rather dusky); legs, including all of the coxae, except the middle and hind femora and all the tibiae rather dusky; sides of T1 and tip of abdomen weakly suffused with ferruginous. Pubescence extensively silvery, most conspicuously so on the lower pleura and the posterior part of the propodeum; front coxae and propodeum with only some sparse, very fine, pale hair. Hind wings hyaline except the tip weakly infuscated; fore wings extensively patterned with brown beyond the basal third, hyaline only in a spot in the first and second discoidal cells, a separate spot in the basal half of the third discoidal cell, a small streak below the stigma, and the space beyond SMC3, which also contains a milky-white blotch. Labrum with a V-shaped emargination. Clypeus 2.8 X as wide as high, truncate below, nearly reaching lower eye margin. Head 1.15 X as wide as high; front very narrow, MID .46 X TFD; UID .78 X LID; POL:OOL = 5:4. Third antennal segment about 4 X as long as its apical width, subequal to UID; apical part of antenna elongate, not thickened, segment nine about 2.3 X as long as thick, more than .6 as long as segment three. Pronotum broadly subangulate behind. Propodeum rather flat in front, with a well-defined oblique declivity the sides of which are weakly rugose. Middle and hind tibiae moderately spinose, with several rows of spines, although the spines are thinner and more sparse than in *auripennis*. Features of fore wing as in the preceding species except as follows: basal vein arising very slightly apicad of junction of transverse median vein; SMC2 1.4 X as wide as high; SMC3 much smaller than 2, only .6 as wide below, less than half as wide above; distance from third intercubital vein to tip of marginal cell fully 1.5 X distance from that vein to stigma. Tip of abdomen moderately compressed.

Male. — Unknown.

Distribution. — Known only from the type. (Map 32.)

Genus *APLOCHARES* Banks

Aplochares Banks, 1944, *Zoologica*, 29: 111 [Type species: *Pompilus imitator* Smith, monobasic]. — Banks, 1947, *Bull. Mus. Comp. Zool.*, 99: 411-413.

Batozonoides Haupt, 1950, *Explor. Parc Nat. Albert*, miss. DeWitte, 69: 51 [Type species: *Batozonoides bruneipes* Haupt, 1950 (= *Aplochares advastes* Banks, 1947; new synonym), monobasic]. **New synonym.**

Generic characters. — Length 9-16 mm.; black, covered with light brown, cinereous, or silvery pubescence; known males with a yellowish stripe on the posterior margin of the pronotum; wings folding longitudinally when at rest, as in *Episyron*. Head and thorax with a very limited amount of erect hair, propodeum with some fine hair on the sides; abdominal venter and last two tergites with strong setae, but none of them thick, bristle-like. Mandibles with two small teeth on inner margin in female, one in male. Clypeus large, somewhat elevated, much wider than lower front in female, slightly so in male; apical margin of clypeus with a sharply defined median emargination in female, merely slightly concave in male. Antennae long and slender, segment three in female much exceeding UID, segment three in male more than twice as long as thick, more than twice as long as segment two. Pronotum very short, sloping steeply, without a dorsal surface, its posterior margin arcuate in female. Thorax, in lateral profile, short, the dorsum strongly arched. Scutellum very prominent; postnotum a very narrow transverse band of nearly equal width throughout. Propodeum sloping strongly for most of its length, without a distinct declivity, with smooth contours. Legs strongly spinose; female with a tarsal comb and also with strong spines on outer side of front tibia; female with apical tarsal segments spined beneath and also with some unusually long spines at apex of penultimate tarsal segments, these spines much over half the length of the apical segments. Claws of female dentate, those of male bifid, the inner ray very close to the outer ray; apical segment of front tarsus of male symmetrical, unmodified. Pulvillar pad of female large, giving rise to about 15-17 rays, that of male smaller, giving rise to about 9-11 rays. Fore wing with stigma very small, but marginal cell large, removed from wing tip by less than its own length; SMC2 and 3 both wide above; third discoidal cell long, second recurrent vein arising much more than half way out on subdiscoidal vein; hind wing with anal vein arching up to meet median vein at or slightly before cubital fork; anal lobe small, .3-.4 as long as submedian cell (fig. 13). Male SGP moderately broad, simple, genitalia with the parameres broad and strongly setose at the basal half, apical half very slender, digiti expanded and setose apically, parapenial lobes simple, nearly straight, slightly exceeding the slender aedoeagus.

Distribution. — Tropical and subtropical South America, north to Honduras.

Included species. — In addition to the type species, considered below, only *adrastes* Banks, from Santa Catarina, Brazil.

Remarks. — The male of the type species is unknown, and the above generalizations are based on that of *adrastes* only. This genus has considerable resemblance to *Agenioideus*, but there seem to me to be enough differences to justify generic status.

Aplochaeres imitator (Smith)

Pompilus imitator Smith, 1864, Jour. Ent., 2: 267 [Type: ♀, BRAZIL: Ega, Amazonas (BMNH, no. 19, 701)].

Aplochaeres imitator Banks, 1944, Zoologica, 29: 111. — Banks, 1947, Bull. Mus. Comp. Zool., 99: 412.

This species is aptly named, for it is strikingly colored for a pompilid, having the body and wings blackish, the apices of the fore wings abruptly whitish, exactly like several social Vespidae which occur commonly within its range (e.g. *Parachartergus apicalis* Fabr.). Species of *Hoplisoides* (Sphecidae) and *Leucospis* (Chalcidoidea) belong to this same mimetic complex.

Female. — Length 11-14 mm. Black, except mandibles largely ferruginous, legs fading to dull ferruginous apically; pubescence brownish, with obscure bluish reflections on the abdomen, reflecting golden on the middle and hind coxae; wings wholly infuscated except apex of fore wing contrastingly whitish (the amount, intensity, and shape of the white is rather variable). Emargination of clypeus sharply defined. Front very narrow, MID .46-.50 X TFD; UID .80-.86 X LID; POL subequal to or slightly exceeding OOL; third antennal segment 1.15-1.25 X UID. Front basitarsus with three slender comb spines (rarely a weak fourth), the apical one about half as long as second tarsal segment. Marginal cell separated from wing tip by about .8 its own length; SMC3 narrowed above by half to two-thirds.

Male. — Unknown.

Distribution. — This species ranges from the Amazon basin north to British Guiana, Venezuela, Colombia, and Honduras. For South America records, see Banks, 1947. (Map 26.)

Central American specimens examined. — 2 ♀ ♀. COSTA RICA: 1 ♀, Turrialba, 31 May 1944 (F. Schrader) [USNM]. HONDURAS: 1 ♀, Corocito, 3 April 1924 (JB) [MCZ].

Genus **SERICOPOMPILUS** Howard

Sericopompilus Howard, 1901, The Insect Book, pl. XI, fig. 17 [Type species: *Pompilus cinctipes* Cresson (= *apicalis* Say), monobasic]. — Ashmead, 1902, Canad. Ent., 34: 82. — Banks, 1912, Jour. N. Y. Ent. Soc., 19: 223, 228. — Dreisbach, 1949, Ent. Amer., (n.s.)29: 6, 11, 36, pl. II, fig. 6. — Evans, 1950, Trans. Amer. Ent. Soc., 75: 202-213 (revision).

Generic characters. — Size 7-17 mm.; slender, with relatively long wings; color predominantly black, sometimes in part rufous, males with pale yellow markings at least on posterior margin of pronotum, sides of posterior rim of propodeum, apical tergite, and parts of the middle and hind tarsi and the hind tibiae. Head, thorax, and propodeum with a moderate amount of erect hair; abdomen of female with some strong setae apically, but without bristles. Head rather thin, the temples not strongly developed. Mandibles with two small teeth on inner margin in female, either one or two teeth in male. Clypeus large, slightly wider than LID. Antennae elongate, segment three at least 4 X as long as thick in female, at least twice as long as thick in male. Pronotum short, sloping steeply in front. Postnotum well developed, constricted and depressed on the median line and also in front of the spiracles, arcuately expanded between. Propodeum with the slope low and even, without a well-defined declivity. Legs slender, strongly spinose; female with a comb on the front tarsus; apical tarsal segments not spined beneath. Claws dentate, except front tarsal claws of male sub-bifid; apical segment of front tarsus of male unmodified, symmetrical. Fore wing with the stigma large, the marginal cell removed from the wing tip by less than its own length, the radial vein evenly arched; SMC2 and 3 both wide above; hind wing with the anal vein meeting the median vein considerably beyond the cubital fork (fig. 14). Abdomen of male very slender, especially basally; SGP with the median line strongly elevated, the apex obtusely pointed or somewhat rounded. Genitalia with the parameres long and slender; basal hooklets double; digiti much broadened apically; aedoeagus simple, much exceeded by the slender parapenial lobes. The terminalia show no noteworthy specific differences within the genus (see figures in Dreisbach, 1949, and Evans, 1950).

Distribution. — Southern North America, with one species ranging north to Connecticut and to Michigan.

Included species. — Only three species of this genus are known, and only two of these are known to occur in Mexico and Central America.

Key to Species

Inner orbits less strongly convergent above, in the female UID from .8 to .9

- X LID, in the male UID subequal to or slightly greater than LID; female entirely black; male with ocelli of normal size, POL slightly exceeding OOL *angustatus* (Cresson)
- Inner orbits strongly convergent above, in the female UID from .7 to .8 X LID, in the male .82-.92 X LID; female with abdomen wholly rufous, legs partly or almost wholly rufous; male with rather large ocelli, POL much greater than OOL *neotropialis* (Cameron)

Sericopompilus angustatus (Cresson)

- Pompilus angustatus* Cresson, 1865, Proc. Ent. Soc. Phila., 4: 452 [Type: ♀, COLORADO (no further data) (ANSP, no. 418)].
- Psammochares fulvoapicalis* Banks, 1910, Jour. N. Y. Ent. Soc., 18: 117 [Type: ♀, TEXAS: Lee Co., 2 Sept. 1905 (G. Birkman) (MCZ, no. 13, 712)]. Synonymy by Evans, 1950.
- Sericopompilus fumosus* Banks, 1933, Psyche, 40: 5 [Type: ♂, COLORADO: Colorado Springs, 12-19 July 1932 (MCZ, no. 17, 050)]. Synonymy by Evans, 1950.
- Sericopompilus angustatus* Evans, 1950, Trans. Amer. Ent. Soc., 75: 205-207, fig. 47. — Krombein, 1958, U. S. Dept. Agri. Monogr. 2, First Suppl., p. 180.

Female. — Length 9-14 mm. Black, upper outer and sometimes middle inner orbits with a very small pale spot; wings wholly infuscated. Body clothed with brownish pubescence, sometimes silvery on lower front. Clypeus 2.0-2.2 X as broad as high, apical margin subtruncate. MID .62-.67 X TFD; UID .8 to .9 X LID; antennal segment three .75-.82 X UID. POL usually slightly exceeding OOL. Posterior margin of pronotum subarcuate. Front basitarsus with three slender comb-spines, the apical one not more than half as long as second tarsal segment.

Male. — Length 7-12 mm. Black, the following pale yellowish: small spots on inner and outer orbits; posterior margin of pronotum rather broadly; a small spot at the extreme base of the fore wing; sides of posterior rim of propodeum; apical tergite; broad basal rings on segments 1, 2, 3, and 4 of the middle tarsi, and on segments 2, 3, and 4 of the hind tarsi; a streak on the hind tibiae; spurs of middle tibiae and sometimes those of the hind tibiae. Wings variable, either hyaline with a brownish apical band, wholly fuscous, or intermediate. Front broad, MID about .65 X TFD; UID subequal to or slightly greater than LID; antennal segment three slightly more than twice as long as thick. Ocellar triangle prominent, POL slightly exceeding OOL. Other features as described under generic heading.

Distribution. — This species is characteristic of central North America, ranging from Wyoming, South Dakota, and Michigan to Florida, west to New Mexico, and south in the Mexican Central Plateau to Jalisco and Guanajuato. (Map 31.)

Mexican specimens examined. — 5 ♀ ♀. CHIHUAHUA: 2 ♀ ♀, Samalayuca, 24 June 1947 (CDM) [AMNH]. ZACATECAS: 1 ♀, Fresnillo, 7000 feet, 15 Aug. 1947 (CDM) [AMNH]. JALISCO: 1 ♀, 117 mi. E Guadalajara, 6100 feet, 1 Oct. 1957 (HAS) [OSU]. GUANAJUATO: 1 ♀, 14 mi. E Celaya, 23 Aug. 1963 (FDP) [UCD].

Sericopompilus neotropicalis (Cameron)

Pompilus neotropicalis Cameron, 1893, Biol. Centr.-Amer., Hymen. II, p. 203 [Type: ♀, GUATEMALA: San Geronimo (GCC) (BMNH, no. 19, 561)].

Pompilus guatemalensis Cameron, 1893, *ibid.*, p. 206 [Type: ♂, GUATEMALA: San Geronimo (GCC) (BMNH, no. 19, 562)]. Synonymy by Evans, 1950.

Psammochares posticatus Banks, 1910, Jour. N. Y. Ent. Soc., 18: 119 [Type: ♂, TEXAS: Lee Co., 2 Oct. 1950 (G. Birkman) (MCZ, no. 13, 709)]. Synonymy by Evans, 1950.

Psammochares fuscipennis var. *georgiana* Banks, 1911, Proc. Ent. Soc. Wash., 13: 238 [Type: ♀, GEORGIA: Bainbridge, 17 Sept.-19 Oct. 1910 (J. C. Bradley) (MCZ, no. 13, 711)]. Synonymy by Evans, 1950.

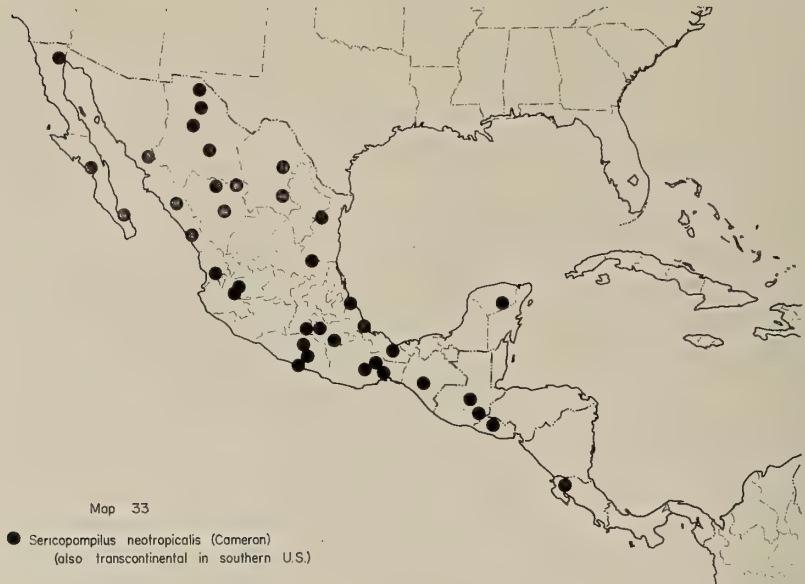
Sericopompilus posticatus Banks, 1912, Jour. N. Y. Ent. Soc., 19: 229.

Psammochares neotropicalis Banks, 1931, Bull. Brooklyn Ent. Soc., 26: 133 (Yucatan).

Sericopompilus neotropicalis Evans, 1950, Trans. Amer. Ent. Soc., 75: 210-213. — Krombein, 1958, U. S. Dept. Agri. Monogr. 2, First Suppl., p. 181.

The type of *neotropicalis* is in excellent condition and conforms to the usual concept of this species. As in other females from the southern parts of the range, the pronotum of the type has a wide yellowish band on the posterior margin and the legs are almost entirely rufous. Most females from the United States lack any band at all on the pronotum and have only the hind legs rufous. There appears to be an irregular north-south cline in the extent of yellow and rufous coloration.

Female. — Length 10-17 mm. Black; abdomen wholly rufous, hind legs rufous except coxae, middle and front legs partly or wholly rufous beyond coxae in specimens from southern parts of the range; inner and outer orbits with small yellowish streaks; collar usually marked with pale yellow, posterior margin of pronotum usually with a pale yellowish stripe; wings wholly infuscated, hind wings rather lightly so basally. Clypeus 2.2-2.4 X as broad as



high, apical margin rounded on the sides, truncate medially. MID .60-.65 X TFD; UID .70-.80 X LID; antennal segment three .90-1.20 X UID. POL: OOL = 3:2. Front basitarsus with three or four comb-spines, the apical one usually .4 to .5 as long as the second tarsal segment.

Male. — Length 7.5-12 mm. Black; second and third abdominal segments and apex of first usually rufous, parts of legs sometimes suffused with rufous; inner and outer orbits with small pale yellow streaks, collar and broad band along posterior margin of pronotum pale yellow, also base of front wings and sides of propodeal rim maculated, legs marked with pale yellow as in the preceding species. Wings clear hyaline, tips of hind wings usually fuscous, tips of fore wings fuscous beyond stigma, usually with a paler, crescentic streak within this fuscous band. MID .60-.66 X TFD; UID .82-.92 X LID; antennal segment three 2.1-2.3 X as long as thick. Ocelli somewhat larger than normal, POL:OOL about 4:3.

Distribution. — In the United States, this species ranges north to Central California, Kansas, Illinois, and North Carolina, but is more common along the southern tier of states. From Mexico south to Costa Rica the species is very widely distributed but is absent at elevations above about 6000 feet. (Map 33.)

Mexican and Central American specimens examined. — 73 ♀♀, 95 ♂♂. TAMAULIPAS: 1 ♀, Villagran, 7 June 1951 (PDH) [CIS].

COAHUILA: 1 ♀, 12 mi. N Hermanas, 11 Aug. 1959 (AM & LS) [UCD]; 1 ♂, 13 mi. N Saltillo, 11 Aug. 1959 (AM & LS) [UCD]. CHIHUAHUA: 1 ♀, 13 mi. S Ciudad Juarez, 18 Aug. 1952 (EG) [CIS]; 1 ♀, Moctezuma, 4 July 1954 (EIS) [CIS]; 2 ♀♀, 3 ♂♂, Santa Clara Canyon, 5 mi. W Parrita, 6 July 1954 (JWM) [CIS]; 1 ♀, 1 ♂, 8 mi. S Ciudad Camargo, 10 Aug. 1951 (PDH) [CIS]. SONORA: 2 ♀♀, 3 ♂♂, 10 mi. E Navajoa, 13 Aug. 1959 (Werner & Nutting) [UA, MCZ]. BAJA CALIFORNIA: 1 ♀, 17 mi. SE Mexicali, 15 June 1952 (MC) [AMNH]; 1 ♀, 23 mi. SE Mezquital, 26 Aug. 1959 (Radford & Werner) [CAS]; 1 ♀, 1 ♂, La Paz, 10 Oct. 1954 (FXW) [CAS]. SINALOA: 1 ♂, Culiacan, 21 July 1959 (HEE) [MCZ]; 1 ♂, Mazatlan, 15 Aug. 1962 (HEE) [MCZ]. DURANGO: 2 ♀♀, 1 ♂, 8 mi. S Canutillo, 9 Aug. 1951 (HEE) [MCZ]; 3 ♀♀, 7 ♂♂, San Juan del Rio, 7 Aug. 1951 (HEE & PDH) [MCZ, CIS]; 23 ♂♂, 14 mi. NW Ceballos, 10 Sept. 1963 (HAS) [OSU, MCZ]. SAN LUIS POTOSI: 1 ♀, El Salto, 1800 feet, 8 June 1961 [KU]. NAYARIT: 1 ♀, Ahuacatlan, 18 July 1951 (HEE) [MCZ]. JALISCO: 2 ♀♀, 8 mi. S Guadalajara, Sept. 1954 (FXW) [CAS]; 1 ♂, Guadalajara, 14 July 1959, 5000 feet (HEE) [MCZ]. GUERRERO: 1 ♀, Acapulco [MCZ]; 2 ♀♀, Mexcala, 29 June 1951 (HEE) [MCZ]; 1 ♀, Tierra Colorada, 2000 feet, Oct. (HHS) [BMNH]; 2 ♀♀, Venta de Zopilote, 2800 feet, June (HHS) [BMNH]; 1 ♀, Chilpancingo, 4600 feet, June (HHS) [BMNH]. MORELOS: 1 ♀, Cuernavaca, 19 July 1961 (RRD) [MSU]; 1 ♀, Xochicalco, 13 July 1961 (RRD) [MSU]; 1 ♀, Huajintlan, 22 Aug. 1956 (RRD) [MSU]; 10 ♀♀, 4 ♂♂, Alpuyeca, May, July (PDH, HEE) [CIS, MCZ, CU]; 1 ♀, 2 ♂♂, Canyon de Lobos, nr. Yautepec, 4000 feet, 25 May 1959 (HEE) [CU]. PUEBLA: 2 ♀♀, Petlalcingo, Aug. 1963 (FDP) [UCD]. VERACRUZ: 1 ♀, Tecolutla, 19 June 1951 (HEE) [MCZ]; 13 ♀♀, 40 ♂♂, Veracruz, June-Aug. (HEE, PDH, RRD, RHP) [MCZ, CU, MSU, CIS, UCD]; 1 ♀, 1 ♂, Minatitlan, 16 Aug. 1961 (RRD) [MSU]. OAXACA: 1 ♀, 5 mi. N Rio Hondo, 10 Aug. 1957 (Chemsak & Rannells) [CIS]; 2 ♀♀, 12 mi. S Chivela, 18 Aug. 1959 (LS & AM) [UCD]; 1 ♂, 64 mi. W Tehuantepec, 21 July 1952 (EG & CM) [CIS]; 1 ♀, 44 mi. W Tehuantepec, 21 July 1952 (EG & CM) [CIS]; 1 ♀, 8 mi. W Tehuantepec, 400 feet, 10 July 1953 [KU]; 1 ♀, 21 mi. E El Camaron, 21 July 1956 (JWM) [CIS]. YUCATAN: 1 ♀, 1 ♂, Chichen Itza, June, July (JB,

HEE) [MCZ]. CHIAPAS: 1 ♀, 1 ♂, 20 mi. S Tuxtla Gutierrez, 12 Aug. 1963 (FDP) [UCD]. GUATEMALA: 2 ♀♀, 1 ♂, San Gerónimo (GCC) [BMNH]; 1 ♀, Tiucal, 20 Aug. 1961 (M. Irwin) [UCD]. EL SALVADOR: 1 ♂, Quezaltepeque, 1 July 1963 (M. Irwin) [UCD]. COSTA RICA: 3 ♀♀, Liberia & vic., 26-29 July 1963 (HAS) [OSU].

Variation. — As mentioned earlier, females from the southern parts of the range tend to have a broad yellowish band on the pronotum (often wholly absent in U. S. specimens) and to have the legs almost wholly rufous. The three Costa Rica females are unusual in having the wings lightly infuscated, the fore wing indistinctly twice-banded with darker fuscous.

Genus EPISYRON Schiødte

Episyron Schiødte, 1837, Krøyer's Naturhist. Tidsskr., 1: 341 [Type species: *Sphex rufipes* Linnaeus, monobasic]. — Banks, 1912, Jour. N. Y. Ent. Soc., 19: 223, 229. — Evans, 1950, Trans. Amer. Ent. Soc., 75: 213-236 (U. S. spp.).

Spilopompilus Ashmead, 1902, Canad. Ent., 34: 81 [Type species: *Pompilus biguttatus* Fabricius, monobasic].

Generic characters. — Length 5.5-18 mm.; black, often with whitish maculations, legs sometimes partly rufous; propodeum, T1, and sometimes parts of the thorax with scale-like pubescence; wings tending to fold longitudinally at rest. Mandibles with two teeth on inner margin in female, one in male. Clypeus large, as wide as or slightly wider than LID, lower margin truncate. Eyes of female convergent above. Antennae elongate, rather compact in males of some species. Postnotum strongly developed, constricted on the median line and again just in front of the spiracles, between the constrictions arcuately expanded. Legs strongly spinose; front tibiae of female with a few spines above, front tarsus with a strong comb. Apical tarsal segments spined beneath in female. All claws bifid in both sexes, inner ray close to outer ray and more or less truncate; apical segment of front tarsus unmodified, parallel-sided. Pulvillar pad small, the comb of not more than nine setulae. Fore wing with basal and transverse median veins interstitial or nearly so; stigma rather small; SMC2 and 3 both sessile above in our species; anal vein of hind wing arching up to meet median vein beyond cubital fork, occasionally interstitial with cubitus (fig. 15). Tip of abdomen of female without stout bristles. Male SGP strongly elevated medially, the apex broadly rounded or subtruncate. Genitalia with the basal hooklets double; parameres slender, with a strong squama about half way from base to apex; digiti subspatulate; parapenial lobes simple, exceeding the aedoeagus. The male terminalia are of little value in separating the species of this genus.

Distribution. — Cosmopolitan, although poorly represented in tropical America.

Included species. — Of the five species occurring in the United States, three enter northern Mexico and one occurs south to Costa Rica.

Key to Species

Females

1. Legs partly or almost wholly rufous; T3 with a pale yellow band or paired spots (occasionally absent or concealed), posterior margin of pronotum almost always with a pale band; body with a considerable amount of whitish erect hair *conterminus posterus* (Fox)
Legs and body entirely black except for limited markings at the margins of the eyes; body hairs dark, or much reduced 2
2. Front basitarsus with four comb-spines; pubescence with only weak bluish or blue-green reflections; propodeum with abundant dark setae
..... *quinquenotatus hurdi* Evans
Front basitarsus with three comb-spines; pubescence strongly reflecting bluish or the propodeum with only a limited amount of short hair 3
3. Eyes strongly convergent above, UID subequal to or less than length of third antennal segment; head, thorax, and propodeum with an abundance of dark erect hair; pubescence reflecting deep bluish
..... *biguttatus montezuma* (Cameron)
Vertex broader, UID considerably exceeding length of third antennal segment; body hairs much reduced, propodeum with only a limited number of short hairs; pubescence at most obscurely metallic *snowi* (Viereck)

Males

1. Tibial spurs black; mandibles black, with dark rufous apices; antennae elongate, flagellar segments generally more than 1.5 X as long as thick 2
Tibial spurs whitish; mandibles (except in rare individuals) tricolored, black, whitish, and rufous; antennae shorter, flagellar segments (except the last) not more than 1.5 X as long as thick 3
2. Hind tibiae wholly black; fine pubescence of body mostly dark; pronotum quite distinctly angulate behind *quinquenotatus hurdi* Evans
Hind tibiae extensively whitish on the outer side; body pubescence extensively silvery; pronotum very broadly and often indistinctly angulate behind *biguttatus montezuma* (Cameron)

3. Abdomen black except apical tergite white; wings with a whitish bloom; pronotum relatively long; legs never in part rufous *snowi* (Viereck)
 T3 with a pale yellow basal band or paired spots (occasionally covered by overlapping of T2); wings without a whitish bloom; pronotum short; hind legs partly rufous in many specimens
 *conterminus posterus* (Fox)

Episyron quinquenotatus hurdi Evans

Episyron quinquenotatus hurdi Evans, 1950, Trans. Amer. Ent. Soc., 75: 221-223.

Female. — Length 7-14 mm. Black, inner and outer orbits with pale yellow streaks; pubescence mainly fuscous, obscurely bluish or violaceous; head, thorax, propodeum, and basal abdominal tergite with numerous dark setae. Front fairly broad and eyes only moderately convergent above; MID .62-.66 X TFD; UID .73-.85 X LID; antennal segment three .80 to 1.05 X UID. Front basitarsus with four slender comb-spines, the basal one usually smaller than the others, the apical one considerably longer than the second tarsal segment.

Male. — Length 5-10 mm. Black, inner and outer orbits narrowly pale, apical tergite mostly whitish (T3 rarely with pale markings basally); fine pubescence of body largely dark except on the front and clypeus; propodeum with a considerable amount of erect hair. Front moderately broad; inner orbits diverging slightly above, UID slightly exceeding LID; antennae elongate, outer flagellar segments (except the last) 1.5-1.9 X as long as wide. Pronotum quite distinctly angulate behind.

Distribution. — Southern British Columbia to northern Baja California, east to Alberta and Utah. See Evans, 1950, for a fuller description and for detailed distribution records. (Map 34.)

Mexican specimens examined. — 1 ♀. BAJA CALIFORNIA: 1 ♀, San Vicente, 8 July 1963 (JP) [CIS].

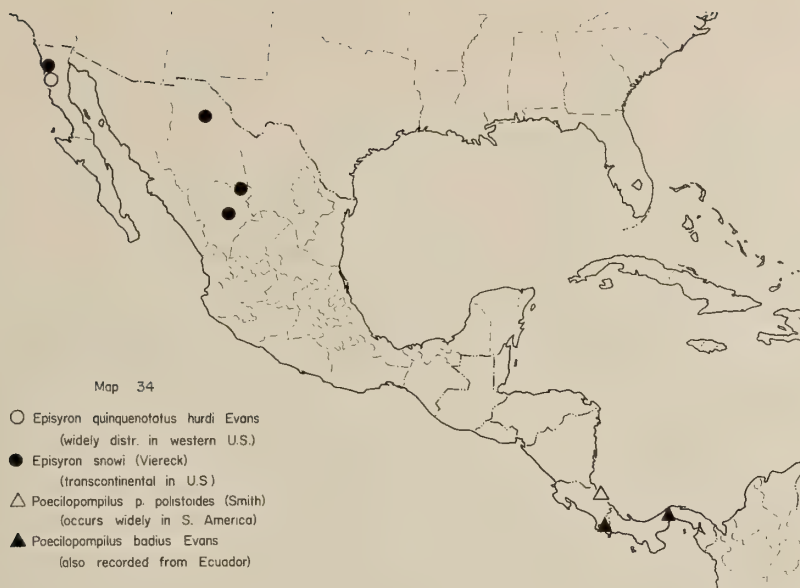
Episyron biguttatus montezuma (Cameron) new combination

Pompilus montezuma Cameron, 1893, Biol. Centr.-Amer., Hymen. II, p. 193, pl. 11, fig. 10 [Type: ♀, MEXICO: GUERRERO: Chilpancingo, 4600 feet, Oct. (HHS) (BMNH)].

Episyron arizonica Banks, 1933, Psyche, 40: 5 [Type: ♀, ARIZONA: Apache Camp, Santa Catalina Mts., 5500 feet, 25 July (JB) (MCZ, no. 17, 033)]. New synonym.

Episyron biguttatus californicus Evans, 1950, Trans. Amer. Ent. Soc., 75: 229-230 (in part).

Although I placed *arizonica* in the synonymy of Banks' *californicus* in 1950, I now consider it useful to employ a subspecific name



for the *biguttatus* population of Mexico and extreme southwestern United States. However, the name *montezuma* has priority over *arizonica*. I am unable to separate the females of *californicus* and *montezuma*, but the males of the latter form differ consistently from those of *californicus* in having paler wings and much paler, extensively silvery pubescence. I should add that the type of *montezuma* is clearly the female which Cameron had before him, as his description of the female is much more detailed than that of the male, the diagnostic features he cites apply to the female and not the male, and the figure is clearly that of the wing of the female. The male, from Omilteme, Guerrero, formerly considered the type, is a specimen of *Pompilus scelestus* Cresson (= *omiltemensis* Cameron). Although the type female of *montezuma* is in good condition, the head and prothorax are densely covered with mold, so I have made no attempt to present a full description of the type, which appears closely similar to females from Morelos and Michoacan.

Female. — Length 9-16 mm. Black, upper outer and middle inner orbits very narrowly marked with pale yellow; pubescence wholly dark, rather conspicuously reflecting shades of deep bluish; fore wing moderately to deeply infuscated, with a darker band along outer margin; hind wings moderately in-

fuscated, darker apically. Head, thorax, propodeum, first abdominal tergite, and coxae clothed rather densely with dark setae; femora sparsely short-setose. MID .60-.64 X TFD; UID .63-.73 X LID; POL slightly to considerably exceeding OOL; antennal segment three measuring from .95 to 1.35 X UID. Front basitarsus with three slender comb-spines, the apical one nearly or quite as long as second tarsal segment.

Male. — Length 6.5-12 mm. Black, inner and outer orbits marked with pale yellow as in female, apical tergite mostly whitish, hind tibiae with a whitish streak for most of their length (but all spurs black); wings clear hyaline, outer margin of fore wing and tip of hind wing contrastingly brown. Pubescence silvery over much of head and thorax, including the legs, on the abdomen forming basal silvery bands on the basal tergites, apical tergites mostly silvery; squamiform pubescence on thorax whitish, on first tergite whitish or rather dark. Body with a variable amount of erect hair, usually dark in color but occasionally in part whitish. MID .60-.65 X TFD; UID 1.0-1.10 X LID; POL usually slightly less than OOL. Antennae elongate, outer flagellar segments (except the last) 1.7-2.0 X as long as wide. Pronotum short, its posterior margin broadly subangulate. Longer spur of hind tibia about .8 the length of the basitarsus.

Distribution. — This form occurs from western Texas to southern Arizona, south through the Mexican Central Plateau to Guerrero and Veracruz. From California and northern Arizona and New Mexico northward the males have darker wings and almost wholly dark pubescence (subspecies *californicus* Banks); from eastern Texas northward and eastward both sexes typically have whitish spots on the abdomen (*b. biguttatus* Fabr.). (Map 35.)

Specimens examined. — 22 ♀♀, 24 ♂♂. TEXAS: 1 ♂, 14 mi. S Marathon, Brewster Co., 9 July 1958 [MCZ]. NEW MEXICO: 1 ♀, 7 mi. SE Rodeo, Hidalgo Co., 21 Aug. 1958 (E. G. Linsley) [CIS]. ARIZONA: 4 ♂♂, Portal and vic., Cochise Co., Sept. [CU, MCZ, AMNH]; 1 ♀, Patagonia, Santa Cruz Co., 10 Aug. 1958 (Werner & Butler) [UA]; 1 ♀, Apache Camp, Santa Catalina Mts., 25 July 1917 (JB) [MCZ]. CHIHUAHUA: 1 ♀, Santa Clara Canyon, 5 mi. W Parrita, 6 July 1954 (JWM) [CIS]; 1 ♀, 2 mi. S Matachic, 21 Aug. 1950 (RFS) [AMNH]. DURANGO: 1 ♀, 1 ♂, 8 mi. S Canutillo, 9 Aug. 1951 (HEE) [MCZ]. ZACATECAS: 5 ♀♀, 9 ♂♂, 15 km. E Sombrerete, 28-31 July 1951 (HEE & PDH) [MCZ, CU, CIS]; 1 ♂, 5 mi. S Fresnillo, 7 Aug. 1954 (RFS) [CIS]. JALISCO: 1 ♀, Villa Guadalupe, 26 July 1951 (PDH) [CIS]; 3 ♂♂, Guadalajara, July, Sept. (HEE, RRD) [MCZ, MSU]; 1 ♀, 6 mi. NE Jalastit-



lan, 6000 feet, July [KU]. MICHOACAN: 3 ♀ ♀, 3 mi. E Carapan, 10 July 1959, 6500 feet (HEE) [CU, MCZ]; 1 ♀, 2 ♂ ♂, 6 mi. NW Quiroga, 11 July 1963 (FDP) [UCD]. DISTRITO FEDERAL: 1 ♀, 2 mi. SE Mexico City, 2 July 1953 (EG & CM) [CIS]. VERACRUZ: 1 ♂, Rio Blanco, 13 Nov. 1957 (RRD) [MSU]. MORELOS: 3 ♀ ♀, 2 ♂ ♂, 3 mi. NW Cuernavaca, 6500 feet, May-June 1959 (HEE) [CU, MCZ]. GUERRERO: 1 ♀, Chilpancingo, 4600 feet, Oct. (HHS) [type, BMNH].

Episyrton snowi (Viereck)

Anoplius (Episyrton) snowi Viereck, 1906, Trans. Amer. Ent. Soc., 32: 202 [Type: ♂, KANSAS: Morton Co., 3200 feet (F. H. Snow) (KU)].

Psammochares maneei Banks, 1910, Jour. N. Y. Ent. Soc., 18: 117 [Type: ♀, NORTH CAROLINA: Southern Pines, 26 June 1909 (A. H. Manee) (MCZ, no. 13, 663)]. Synonymy by Evans, 1950.

Episyrton laevis Banks, 1933, Psyche, 40: 4 [Type: ♀, TEXAS: Fedor, Lee Co., 27 Mch. 1909 (G. Birkman) (MCZ, no. 17, 032)]. Synonymy by Evans, 1950.

Episyrton snowi Evans, 1950, Trans. Amer. Ent. Soc., 75: 233-236.

Female. — Length 8-13 mm. Color black, upper outer orbits usually with a very small pale stripe; pubescence brownish, at most very obscurely re-

flecting metallic on the abdomen; squamiform pubescence usually quite extensive, somewhat brownish; wings lightly infuscated, with a darker band at the outer margin. Erect setae of head, thorax, and propodeum very short, rather sparse, dark or rather pale. MID .61-.65 X TFD; UID .75-.82 X LID; POL:OOL about as 5:3, ocellar triangle very broad and flat. Vertex raised in an even arc above eye tops; third antennal segment equal to .8 to .9 X UID. Pronotum long for the genus, its posterior margin arcuate. Front basitarsus with three comb-spines, the apical one 1.2-1.5 X the length of the second tarsal segment.

Male. — Length 5-10.5 mm. Color black, marked with whitish on center of mandibles, outer and often inner orbits very narrowly, sometimes at apex of scape and/or posterior margin of pronotum and/or base of fore wing, apical abdominal tergite, most of outer side of hind tibia, tibial spurs, and a spot at apex of front tibia; wings hyaline, with a whitish bloom, apical margin of fore wing somewhat infuscated. Pubescence mostly pale, squamiform pubescence extensive and conspicuous, whitish. Body with a variable amount of white, erect hairs. MID .60-.67 X TFD; UID 1.05-1.15 X LID; ocellar triangle broad and flat, POL slightly exceeding OOL. Antennae relatively short and thick, flagellar segments rather distinctly separated below, imbricate above (see fig. 66 in Evans, 1950). Pronotum long for the genus, arcuate or weakly angulate behind. Longer spur of hind tibia about .9 the length of the basitarsus.

Distribution. — Florida, Texas, Durango, and Baja California north to Washington, South Dakota, Illinois, and New Jersey. (Map 34.)

Mexican specimens examined. — 1 ♀, 10 ♂♂. BAJA CALIFORNIA: 1 ♂, San Vicente, 8 July 1963 (PDH) [CIS]. CHIHUAHUA: 1 ♂, Villa Ahumada, 28 July 1953 [KU]. DURANGO: 1 ♂, San Juan del Rio, 7 Aug. 1951 (HEE) [MCZ]; 1 ♀, 7 ♂♂, 14 mi. NW Ceballos, 10 Sept. 1963 (HAS) [OSU].

Episyron conterminus posterus (Fox) new combination

Pompilus posterus Fox, 1893, Canad. Ent., 25: 115 [Type: ♀, FLORIDA: So. part (Robertson) (ANSP, no. 4717)].

Pompilus exactus Cameron, 1893, Biol. Centr.-Amer., Hymen. II, p. 202, pl. XI, fig. 23 [Type: ♀, MEXICO: YUCATAN: No. part (Gauger) (BMNH, no. 19, 551)]. Synonym by Evans, 1950.

Pompilus temaxensis Cameron, 1893, *ibid.*, p. 208 [Type: ♂, MEXICO: YUCATAN: Temax (Gauger) (BMNH, no. 19, 549)]. New synonym.

Pompilus porus Fox, 1894, Proc. Calif. Acad. Sci., (2)4: 98 [Type: ♀, MEXICO: BAJA CALIFORNIA: San José del Cabo (CAS, no. 240)]. Synonym by Evans, 1950.

- Episyron posterus* Banks, 1912, Jour. N. Y. Ent. Soc., 19: 229. — Evans, 1950, Trans. Amer. Ent. Soc., 75: 223-226.
- Episyron exactus* Banks, 1931, Bull. Brooklyn Ent. Soc., 26: 133 (Chichen Itza, Yucatan).
- Episyron porus* Bradley, 1944, Notulae Naturae, Acad. Nat. Sci. Phila., no. 145, p. 11.

The type of *Episyron conterminus* Smith (BMNH, no. 19, 550) is a female from Pará, Brazil. I have seen additional specimens from Peru, Bolivia, and Argentina as well as several localities in Brazil; *Episyron fraternus* Banks is a synonym (new synonym). *E. conterminus* is virtually identical to *posterus* except that the spurs of the female are whitish and the antennae of the males ferruginous beneath. It seems best to regard *conterminus* and *posterus* as subspecies of one species; presumably the ranges of the two forms are contiguous in Panama or extreme northwestern South America. The type of *temaxensis* is in poor condition and is a small specimen with reduced maculations, but there is no question that it represents a male *posterus*. Some aspects of variation in this species are discussed below.

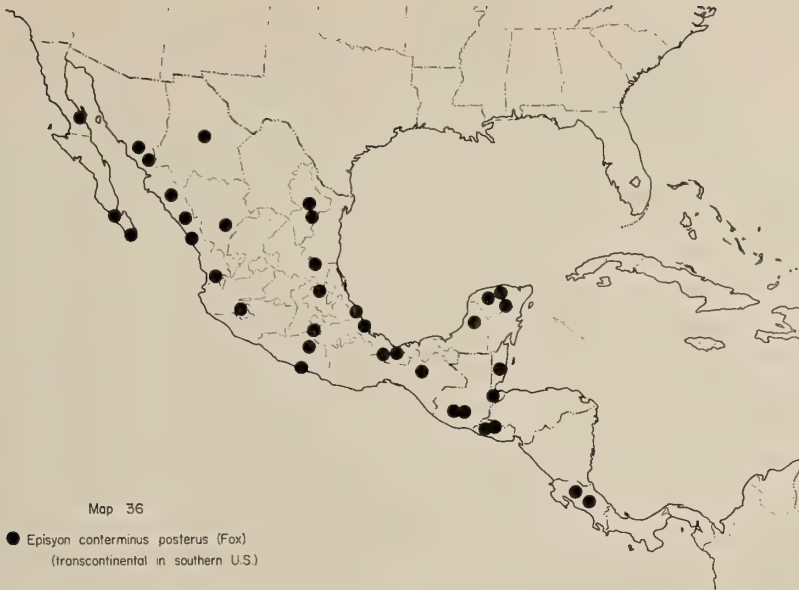
Female. — Length 6-13 mm. Black; hind femora and tibiae rufous, the legs often more extensively rufous, but the coxae and trochanters always black; pale yellow markings present on inner and outer orbits, pronotal collar, posterior margin of pronotum (rarely absent), small spot at extreme base of fore wing, sometimes a rectangular spot on the mesoscutum, a band or pair of spots on T3 (sometimes concealed, rarely absent); spurs blackish or rufous; wings hyaline or lightly infuscated, darker along outer margin. Pubescence extensively silvery, often with a tendency to form bands on the abdomen; squamiform pubescence silvery or somewhat coppery, sometimes with greenish reflections; erect hairs of body pale, fairly abundant on head, pronotum, and propodeum. MID .59-.64 X TFD; UID .68-.80 X LID; antennal segment three .85-1.10 X UID; POL somewhat exceeding OOL. Front basitarsus with three comb-spines, the apical one 1.2-1.5 X length of second tarsal segment. SMC3 considerably narrower both above and below than second.

Male. — Length 4.5-9.5 mm. Color pattern similar to that of female, but the legs sometimes almost entirely blackish except usually for a tinge of rufous on the hind tibiae; spurs whitish; mandibles usually partly whitish; hind tibiae often with a whitish streak; spurs and usually most of spines on tibiae whitish; apical tergite whitish; wings hyaline, with a dark marginal band. Pubescence and erect setae as in female. MID .58-.62 X TFD; UID slightly exceeding LID. Antennae rather compact, outer flagellar segments less strongly separated and imbricate than in *snowi*, but measuring (except for the apical segment) not

more than about 1.5 X as long as thick. Pronotum short, its posterior margin arcuate. Longer spur of hind tibia about .8 the length of the basitarsus.

Distribution. — This is a widely distributed and not uncommon form at low to moderate elevations in Central America and Mexico, ranging from Costa Rica north to California, in the Mississippi Valley to Illinois, and up the Atlantic Coastal Plain to Long Island. (Map 36.)

Mexican and Central American specimens examined. — 55 ♀ ♀, 71 ♂ ♂. NUEVO LEON: 2 ♀ ♀, 50 mi. SE Monterrey, 1700 feet, 12 Oct. 1957 (HAS) [OSU]; 1 ♀, 31 mi. NW Linares, 1500 feet, 12 Oct. 1957 (HAS) [OSU]. CHIHUAHUA: 1 ♂, Chihuahua, 12 Aug. 1951 (PDH) [CIS]. SONORA: 1 ♀, La Aduana, 12 June 1961 (FDP) [UCD]; 2 ♂ ♂, Cocorit, May-June (FDP) [UCD]; 1 ♂, 10 mi. E Navajoa, 13 Aug. 1959 (Werner & Nutting) [UA]. BAJA CALIFORNIA: 1 ♀, 1 ♂, Angeles Bay, 26-27 June [CAS]; 1 ♀, San José del Cabo [CAS]; 7 ♂ ♂, 25 mi. W La Paz, Aug.-Sept. 1959 (Radford & Werner) [UA]. SINALOA: 2 ♀ ♀, Mazatlan, July, Oct. [MCZ, CAS]; 1 ♀, Guamuchil, 6 May 1953 (EIS) [CIS]; 2 ♀ ♀, 13 ♂ ♂, 8 mi. SE Elota, 18 May 1962 (FDP) [UCD]; 13 mi. N Culiacan, 17 Mch. 1962 (FDP) [UCD]. DURANGO: 1 ♀, 1 ♂, 4 mi. N Nombre de Dios, 13 May 1962 (FDP) [UCD]. NAYARIT: 1 ♀, 1 ♂, Ahuacatlán, 18 July 1951 (PDH, HEE) [CIS, MCZ]. JALISCO: 1 ♀, El Tigre, 18 July 1954 (EIS) [CIS]. SAN LUIS POTOSI: 1 ♀, Ciudad del Maiz, 23 July 1954 (RRD) [MSU]. HIDALGO: 3 ♀ ♀, Jacala, 1 Sept. 1963 (HAS) [OSU]. GUERRERO: 1 ♀, Acapulco, 1 July 1951 (PDH) [CIS]; 1 ♀, Xalitla, 20 Mch. 1959, 1500 feet (HEE) [CU]. MORELOS: 1 ♀, 12 ♂ ♂, 3 mi. N Alpuyecá, Mch.-Apr. 1959 (HEE) [CU, MCZ]; 2 ♀ ♀, 3 ♂ ♂, Canyon de Lobos, nr. Yautepec, Mch.-May 1959, 4000 feet (HEE) [MCZ, CU]; 1 ♀, 2 ♂ ♂, Cuernavaca and vic., Mch., Apr. (HEE, LS) [CU, UCD]. VERACRUZ: 1 ♀, Veracruz, 20 June 1951 (PDH) [CIS]; 2 ♀ ♀, 8 ♂ ♂, 16 mi. S Tecolutla, 26 June 1953 [KU]; 3 ♀ ♀, 3 ♂ ♂, Minatitlan, 26 Aug. 1961 (RRD) [MSU]; 1 ♀, 1 ♂, Acayucan, 23 Oct. 1957 (RRD) [MSU]. CAMPECHE: 1 ♂, 20 mi. E Campeche, 13 Aug. 1963 (HAS) [OSU]. YUCATAN: 3 ♂ ♂, Merida, 25 July 1962 (HEE) [MCZ]; 7 ♀ ♀, Chichen Itza, June 1929 [MCZ]; 3 ♂ ♂, Temax (Gaumer) [BMNH]; 9 ♀ ♀, 2 ♂ ♂, No. part (Gaumer) [BMNH]. CHIAPAS: 1 ♂, Ixtapa, 11 Apr. 1962 (FDP)



[UCD]. BRITISH HONDURAS: 1 ♂, Augustine Mt. Pine Ridge, July 1963 (CCP) [MCZ]. GUATEMALA: 1 ♂, Capetillo (GCC) [BMNH]; 1 ♀, El Salto, Escuintla, 28 June 1934 (FXW) [MCZ]; 4 ♀ ♀, Moca Guatalon, 1000 meters, Mch., Apr. 1931 (JB) [MCZ]; 1 ♀, Quirigua (W. P. Cockerell) [USNM]. EL SALVADOR: 1 ♀, Sonsonate, 18 Nov. 1954 [USNM]; 1 ♀, 1 ♂, Quezaltepeque, June, July 1961, 1963 (M. Irwin) [UCD]. COSTA RICA: 1 ♂, San José, 1913 [MCZ]; 1 ♀, Tilarán, Guanacaste Prov., 1000 feet elev., 25 Feb. 1964 (HEE) [MCZ].

Variation.—The color variation noted above appears to bear little correlation with geography. Females with all the legs rufous (*exactus* Cameron) average slightly larger than those with only the hind legs rufous. I have seen *exactus*-type females from eastern and western Texas, Arizona, California, Sonora, Durango, San Luis Potosi, Nayarit, Morelos, Yucatan, Guatemala, and El Salvador. Curiously, females of intermediate coloration (middle legs partly rufous, front legs black) are uncommon; I have seen only one, from eastern Texas. The presence or absence of a yellowish spot on the mesoscutum also seems to be little influenced by geography, although a higher percentage of specimens from the southern parts of the range have such a spot.

Genus **AUSTROCHARES** Banks

Austrochares Banks, 1947, Bull. Mus. Comp. Zool., 99: 423-428 [Type species: *Pompilus gastricus* Spinola, original designation].

Generic characters. — Size 7 to 14 mm.; head and thorax black, abdomen black or ferruginous, maies with or without yellowish maculations on head, thorax, abdomen, and legs; body with a variable amount of erect hair, propodeum always with a moderate amount of erect hair; body without scale-like pubescence; abdomen of female with some strong setae ventrally and apically, but the apical tergite without dense, stiff bristles. Mandibles with one or two teeth on the inner margin. Labrum protruding slightly from beneath the clypeus, which is rather convex, apical margin concave or weakly emarginate; clypeus only slightly if at all wider than LID, its upper margin strongly sinuate. Malar space present, generally about half as long as the antennal pedicel. Head only slightly wider than high; front and vertex rather broad, the vertex arched somewhat above the eye tops; temples well developed and eyes strongly convergent above in the females. Antennae quite elongate, especially in the males, in this sex slightly crenulate in profile toward the apex. Postnotum a transverse band which is somewhat arcuately expanded on each side of the midline. Propodeum rather short and with the slope high. Females with a strong tarsal comb, the spines always longer than the width of the tarsus; apical tarsal segments with a median row of spines beneath. All claws of both sexes bifid, the inner ray rather long, truncate or subtruncate apically; last segment of front tarsus of male slender, unmodified; pulvillar pad very small, the comb weakly developed. Fore wing with the transverse median and basal veins interstitial; marginal cell removed from wing tip by about or somewhat more than its own length; three SMCs present, the third much narrowed above, sometimes triangular; hind wing with the anal vein arching up to meet the media at or slightly beyond the origin of the cubitus (fig. 16). Male SGP simple, tapering to a rounded apex, its median line strongly elevated. Genitalia with the basal hooklets double; parameres slender, elongate; digiti somewhat expanded apically, bearing fairly large setae; aedoeagus simple (fig. 38).

Distribution. — Argentina and Chile through western South America to southern Mexico.

Included species. — As here defined, this genus includes only the type species, *gastricus* Spinola, from Chile and parts of Argentina; *elsinore* Banks, from Peru; *mexicanus* Dreisbach, from Mexico; and at least one undescribed South American species. The other species included here by Banks, 1947, belong to an undescribed genus related to *Anoplius* and *Pompilus*.

Remarks. — There can be no question that *Austrochares* in the sense of Banks is diphyletic. *Austrochares* in the restricted sense is

closely related to *Episyron*, *Poecilopompilus*, and *Sericopompilus*. The male genitalia of *mexicanus* are strikingly similar to those of *gastricus* despite the great difference in color between those two species; indeed, the genitalia and SGP are very much alike throughout these four closely related genera.

Austrochares mexicanus Dreisbach, new species

Holotype. — ♀, MEXICO: VERACRUZ: Minatitlan, 26 Aug.-1 Sept. 1961 (RRD) [MSU].

The following description is extracted from an unfinished manuscript of the late Robert R. Dreisbach, who should be credited with the discovery and naming of this species. The comments on variation which follow the description of the type and allotype are mine.

Description of type female. — Length 8.6 mm.; fore wing 7.4 mm. Head and thorax a shining black; abdomen completely rufous except extreme base of first tergite; coxae, trochanters, first two pair of femora and tibiae black; first pair of tarsi very dark rufous; apex of posterior femora and all of posterior tibiae and tarsi rufous with the apex of tarsal joints slightly darkened; antennae and mouth parts black, except mandibles in middle are slightly rufous; clypeus truncate in front, appearing concave by virtue of a black shining hairless rim over about middle of front; clypeus, face, front, pronotum and mesonotum densely silvery pubescent in reflected light, rest of thorax only slightly so, short white hair under head; all coxae silvery pubescent below, with no long hair; in side view clypeus elevated above face from base to apex; clypeus 2.4 X as broad as long and about 0.5 of its middle at base extends above the sides of face, and it does not extend under eyes; antennae about 0.5 X the length of second antennal segment above clypeus; lower interocular distance 1.2 X the upper; head about as long as broad; middle interocular distance 0.58 X the transfacial; lateral ocelli about 1.25 X as far from eyes as from each other; pronotum slightly concave behind; dorsal surface of propodeum on a slight slope, short and forming a steep rounded angle with posterior surface; wings very dark, actually black, when folded above abdomen; first and second recurrent veins meet second and third cubital cell about apical 0.3 and a little beyond middle; basal and transverse veins interstitial and in rear wings subdiscoidal vein is just barely apicad of cubitus; front basitarsi with four very long comb spines, even the first spine (which is the shortest) as long as second tarsal segment, all eight spines very long, and not spatulate; the tibiae and tarsi with many long spines, a row of prominent spines underneath last joint of posterior tarsi; all claws cleft.

Allotype. — ♂, same data as type [MSU].

Description of allotype male. — Length 9.2 mm., fore wing 8.2 mm. Head with the inner orbits from clypeus to above fore ocellus with broad white stripes which are indented with black opposite bases of antennae, and the outer 0.33 of width of clypeus also with a wide white band, which covers apical third of clypeus where the wide band is reduced to a preapical strip about 0.33 as the wide broad band on side which extends across the clypeus; posterior orbits also white; the posterior edge of pronotum bright yellow, clear across thorax; a small spot on mesonotum in center just behind tegula, the apical third of scutellum, the apical dorsal part of postscutellum, a preapical band on slope of propodeum, extending to the sides, and a spot on the outside just behind it, light yellow; a faint fuscous band at base of second tergite, a very broad yellow band on third tergite which reaches the sides, narrower yellowish band on rest of tergites which do not reach sides, except the 5th and 6th are all yellowish white dorsally; coxae all black, first two pair femora about apical 0.33 rufous, basal 0.66 blackish, third pair about apical 0.66 rufous; tibiae blackish at base and tip, rest rufous; tibial spurs white; tarsal segments white at base, black at apex; tibiae with a white streak on outside; tibiae rufous underneath, blackish underneath; a very prominent ocular-malar space between the eyes and the mandibles, about the length of the second antennal segment; the clypeus does not extend under the eyes and it is slightly more than 2.0 X as wide as long; lower interocular distance about equal to the upper; middle interocular distance about 0.63 X the transfacial; head 1.1 X as wide as high; lateral ocelli slightly farther from eyes than from each other; ratio of lengths of first four antennal segments 40:10:43:43; first antennal joint whitish on inside and the mandible whitish on almost its whole length, darkish at tip; eyes reach vertex and head is very small and thin; the lateral ocelli are located at the very edge of the line connecting the rear edge of eyes, the ocelli at the rear edge of vertex and the vertex starts sloping downward right at edge of ocelli; ratio of length of scutellum, postscutellum, and metapostnotum 60:20:5; these measurements right in middle, metapostnotum thus very narrow, but the postscutellum well developed; fore wings hyaline, except that the apex beyond the cubital cells is strongly blackened for about 0.75 of their length beyond the veins, and the cubital cells are also slightly fumose; the first and second recurrent veins meet second and third cubital cells beyond the middle at the apical 0.40; the third intercubital vein sloped inward so that the length of marginal vein on third cubital cell is only 1/11 of its length on cubitus; second cubital cell almost square; the basal and transverse veins in fore wings practically interstitial, and the discoidal vein in rear wings also practically interstitial; claws of legs split; propodeum smooth, no ridges and in a smooth curve to apex; upright hair on pronotum and propodeum, body smooth but with very fine dense pubescence over most of body; subgenital plate with a dorsal flat surface almost its whole length; genitalia with the parameres hardly wider than a line, curved inward; parameres and parapenials of equal length, aedeagus slightly shorter, volsellae the shortest; the aedeagus split into two lobes about apical 0.25 [see figure 38, drawn by HEE from one of the paratypes].

Distribution. — Southern Mexico. (Map 26.)

Paratypes. — 1 ♀, 4 ♂♂, same data as type and allotype [MSU, MCZ].

Additional specimens examined. — 2 ♀♀, same data as type series [MSU]. 1 ♀, CHIAPAS: Ixtapa, 11 April 1962 (FDP) [UCD].

Variation. — The females vary in length from 8.5 to 10 mm. MID varies from .58 to .63 X TFD; OOL exceeds POL slightly (as 5:4) in the Chiapas specimen; the anal and cubital veins of the hind wing are interstitial in one of the Veracruz specimens. Otherwise there is little variation worthy of note. The males vary in length from 7 to 9.2 mm. and show no noteworthy variation in color. The head varies from 1.05 to 1.10 X as wide as high, MID from .63 to .66 X TFD. The labrum is well exerted in all the males.

Genus *POECILOPOMPILUS* Howard

Poecilopompilus Howard, 1901, The Insect Book, pl. V, fig. 1, and Pl. XI, fig. 18 [Type species: *Pompilus navus* Cresson (= *interruptus interruptus* Say), designated by Ashmead, 1902.]. — Ashmead, 1902, Canad. Ent., 34: 82. — Evans, 1950, Trans. Amer. Ent. Soc., 75: 236-253 (revision of U. S. spp.).

Batozonus Howard, 1901, The Insect Book, pl. XI, fig. 24 [Type species: *Pompilus algidus* Smith, monobasic; synonym by Evans, 1950]. — Ashmead, 1902, Canad. Ent., 34: 81.

Batazonus Banks, 1912, Jour. N. Y. Ent. Soc., 19: 221, 224 (error for *Batozonus*). — Banks, 1947, Bull. Mus. Comp. Zool., 99: 374-381 (So. American spp.).

Eubatozonus Haupt, 1950, Explor. Parc Nat. Albert, Miss. de Witte, Fasc. 69, pp. 51-52, 54 [Type species: *Eubatozonus pulcher* Haupt (= *flavopictus ventralis* Banks), monobasic]. New synonym.

Generic characters. — Size 6-28 mm.; variously patterned with black, brown, ferruginous, and/or yellow, often resembling species of *Polistes*; body without scale-like pubescence; wings with only a slight tendency to fold longitudinally. Head and thorax with a moderate amount of erect hair, propodeum always hairy; apex of abdomen of female without bristles. Apical three segments of maxillary palpi each much shorter than third segment. Mandibles with two small teeth on inner margin in female, one in male. Labrum protruding somewhat from beneath clypeus, bearing a median slit. Clypeus large, convex, its upper margin with a strong sinuation on each side. Head of male unusually wide; inner orbits convergent above in both sexes, in female very strongly convergent; malar space practically absent. Antennae elongate, segment three in female more than 5 X as long as thick, subequal to or greater

than UID; male with scape short, not twice as long as its greatest thickness, outer part of flagellum somewhat crenulate in profile. Pronotum short, its median line usually faintly impressed; postnotum expanded on each side of the median line, as in *Episyron*. Legs strongly spinose; femora with numerous minute spines; front tibiae spinose above; female with a tarsal comb. Pulvillar pad small, comb consisting of about 7 weak, diverging setae. Claws of female dentate or bifid, those of male bifid; apical segment of front tarsus of male unmodified, the two claws alike. Fore wing with margin cell long, SMC2 and 3 both wide above; hind wing with anal vein reaching median vein well beyond cubital fork (fig. 17). Abdomen of male in cross-section subtrigonal, the dorsum rather flat. SGP tectiform, its apex rounded. Genitalia with the basal hooklets double, aedoeagus somewhat bilobed apically, parameres slender and elongate.

Distribution. — This genus is restricted to the New World, being replaced in the Old World by the closely related genus *Batozonellus* Arnold. Our species collectively range from southern Canada to Argentina, including the West Indies.

Included species. — This genus is much in need of a careful revision. All of the species show considerable variation in color pattern, and there are relatively few structural differences between the species. Eight different entities can be discerned in Mexico and Central America; these are here treated as five species, two of them polytypic. In the key which follows, I have attempted to include all subspecies occurring in continental North and Central America and, in the case of *algidus*, the West Indian subspecies.

Key to Species

1. Female: claws of front tarsus bifid, those of middle and hind tarsi dentate; eyes very strongly convergent above, UID .50-.55 X LID. Male: clypeus with its lower margin evenly, convexly rounded; aedoeagus with a pair of large, flaring apical lobes (*algidus*) 2
- Female: all claws dentate; eyes less strongly convergent above, UID at least .6 X LID. Male: clypeus with its lower margin truncate; aedoeagus with narrower and less flaring apical lobes 7
2. Wings dark fuliginous, violaceous; body color deep castaneous to black, T3 with contrasting orange markings; sides of propodeal declivity roundly protuberant (eastern U.S.) *algidus algidus* (Smith) ¹⁵

¹⁵ This subspecies does not occur south of Texas. Cresson's (1869) record of *algidus* from Orizaba, Mexico, is surely an error; there are no specimens from this locality in the ANSP.

- Wings brownish to orange-yellow, at most weakly violaceous and at least slightly suffused with yellow; body largely castaneous, or if rather dark the apical part of the abdomen is contrastingly yellowish; sides of propodeum less strongly produced 3
3. Abdomen beyond segment one or two almost wholly yellow, contrasting to the thorax and base of the abdomen 4
- Abdomen wholly castaneous except basal tergites somewhat darkened apically and T3 often with basal yellowish markings 5
4. Wings brownish, rather strongly suffused with yellowish, but not as below; thorax mostly castaneous, with very limited black markings
..... *algidus willistoni* (Patton)
- Wings flavous or bright yellow-brown, rather uniformly so except outer margins with a fuscous band; thorax, propodeum, and basal abdominal segment rather strongly suffused with blackish (western U. S.)
..... *algidus coquilletti* (Provancher)
5. Yellow maculations of thorax rather extensive, involving part of the mesopleura as well as the upper part of the metapleura; propodeum marked with yellow anterior to the rim; wings rather pale, strongly tinged with yellowish (West Indies) *algidus gundlachi* (Cresson)
- Yellow maculations of thorax not involving mesopleura, sometimes extending onto metapleura above; propodeum marked with yellow at most on posterior rim 6
6. Yellow maculations of thorax and abdomen rather weak, often nearly absent; propodeum, in lateral profile, rather strongly arching
..... *algidus marcidus* (Smith)
- Yellow maculations of thorax and of T3 usually sharply defined and rather intense; slope of propodeum very low, almost flat behind, sides of declivity slightly gibbous *algidus fervidus* (Smith)
7. Fore wing with marginal cell very long, removed from wing tip by only about .6 its own length; sides of posterior rim of propodeum forming a sharp right angle; color dark castaneous to fuscous, yellow markings very limited *badius* n. sp.
- Fore wing with marginal cell shorter, removed from wing tip by about its own length, or at most slightly less (fig. 17); sides of posterior rim of propodeum not sharply angular; color variable, usually more strongly patterned than above 8
8. Head, in anterior view, with the vertex straight across or arching weakly between tops of eyes, the ocelli on or close to the vertex crest; males with the eyes moderately convergent at top, UID .80-.95 X LID; T1 sloping rather weakly in profile; thoracic pleura often extensively yellow, the pubescence so fine that the yellow appears strongly polished; propodeum commonly yellow, often with a median black band 9
- Vertex, in anterior view, more distinctly arched above eye tops, UID in male .90-1.0 X LID; T1 more strongly convex in profile; thoracic pleura with limited yellow markings if any, the mesopleura with or without a

- streak or triangle on the lower part, sometimes with a streak above; pubescence of pleura rather strong; propodeum usually with a transverse yellow band behind, never with a black median band separating yellow sides (*interruptus*) 10
9. Meso- and metapleura wholly yellow, mesosternum yellow or in part black, legs yellow suffused with ferruginous, rarely with limited dark markings on coxae; slope of propodeum rather strong, color of propodeum variable *polistoides polistoides* (Smith)
- Meso- and metapleura with prominent black markings at least along the sutures, mesosternum wholly black, coxae and usually the femora streaked with black; propodeum with a median black stripe, its slope tending to be lower than in *polistoides*, at least in males *flavopictus flavopictus* (Smith)
10. Female: front basitarsus with three comb-spines; clypeus with a distinct though shallow median notch. Male: middle and hind femora black with a yellow stripe below for most of their length; wings nearly clear hyaline except for a fuscous band at the apical third of the anterior part of the fore wing *interruptus dubitatus* (Cameron)
- Female: front basitarsus with four comb-spines; clypeus truncate apically. Male: femora without a long yellow streak below; fore wings extensively suffused with yellow-brown 11
11. Thorax almost always with some castaneous or ferruginous parts, sometimes mostly castaneous; mesoscutum rarely wholly black; coxae never wholly black; abdomen usually conspicuously, broadly banded with yellow and fuscous or ferruginous *interruptus interruptus* (Say)
- Thorax predominantly black, mesoscutum black or with some yellow markings behind and on the sides; coxae black, rarely with a very small amount of yellow; abdomen mostly yellow, the tergites very narrowly black basally (except sometimes first two) and with some ferruginous markings apically, or wholly blackish or dusky ferruginous 12
12. Abdomen mostly yellowish; head and thorax liberally marked with yellow, propodeum almost always with a transverse yellow band; wings in large part rather bright yellowish-brown (Central valley of California) *interruptus semiflavus* n. subsp.
- Abdomen dusky ferruginous or more or less fuscous, without yellow markings; propodeum usually without a yellow band, only the posterior rim in part yellow; wings darker, strongly suffused with brownish (North-eastern U. S. & eastern Canada) *interruptus cressoni* (Banks)

Poecilopompilus algidus marcidus (Smith)

Pompilus marcidus Smith, 1862, Jour. Ent., 1: 395 [Type: ♀, MEXICO: VERACRUZ: Orizaba (BMNH, no. 19, 587)].—Cresson, 1867, Trans. Amer. Ent. Soc., 1: 110. —Cresson, 1869, Proc. Boston Soc. Nat.

Hist., 12: 371. — Cameron, 1893, Biol. Centr.-Amer., Hymen. II, p. 211.

Pompilus pygidialis Kohl, 1886, Verh. Zool.-Bot. Ges. Wien, 36: 314, 334 [Lectotype: ♀, MEXICO: MORELOS: Cuernavaca (Bilimek) (? Vienna Mus.)]. New synonym.

Batozonus marcidus Bradley, 1944, Notulae Nat., Acad. Nat. Sci. Phila., no. 145, p. 10.

Poecilopompilus algidus marcidus Evans, 1950, Trans. Amer. Ent. Soc., 75: 243-245 (in part).

This form intergrades with the North American *algidus* Smith in Texas and is barely distinguishable from *fervidus* Smith of Panama and South America. I have not seen the type of *pygidialis*, which was described from specimens from Cuba, Buenos Aires, and Mexico. To avoid future confusion, the Mexican specimen is here designated lectotype.

Female. — Length 17-22 mm. Entire body castaneous, frequently with dull yellowish markings on posterior margin of pronotum, center of metanotum, and sides of posterior rim of propodeum; basal tergites with rather dark posterior margins, T2 occasionally with indistinct yellowish markings at base; apical 6 or 7 segments of antennae blackish; often with some blackish in ocellar triangle, along sutures of thorax, or at joints of tarsi. Wings wholly brownish, fore wing often paler toward the apex than basally, often somewhat tinged with luteous. Body pubescence pale, brownish-golden, erect setae also pale. Clypeus 2.2-2.3 X as wide as high, its apical margin truncate. Head broad, TFD 1.12-1.18 X VFD; vertex raised in an even arc above eye tops. MID .52-.57 X TFD; UID .50-.55 X LID; antennal segment three 1.3-1.5 X UID; POL:OOL = 5:4. Posterior margin of pronotum broadly angulate. Postnotum largely concealed on the mid-dorsal line. Propodeum sloping rather evenly, not notably protuberant on the sides. Front basitarsus with three comb-spines, the apical one subequal in length to second tarsal segment. Claws of front tarsus bifid, inner ray subtruncate, remaining claws dentate. Fore wing with marginal cell removed from wing tip by slightly less than its own length; SMC3 about as wide as, or wider than second, more strongly narrowed above than second.

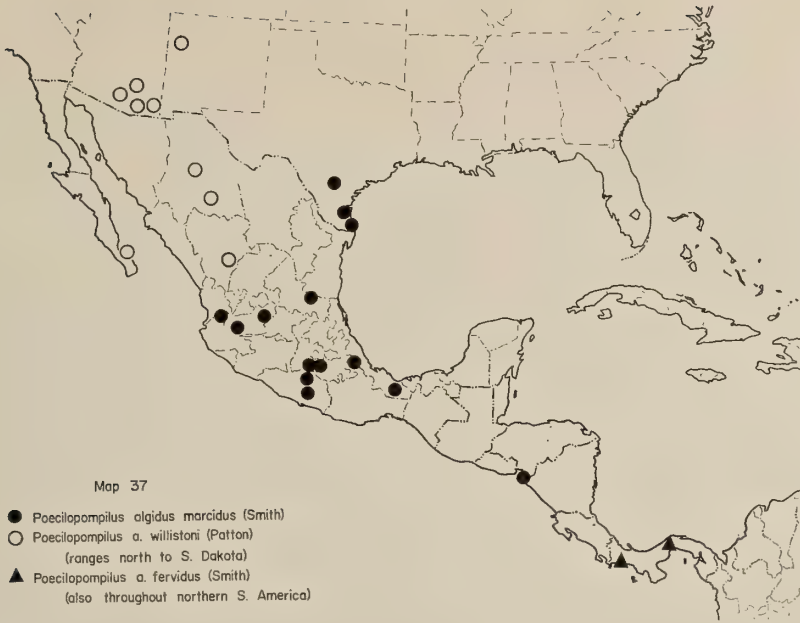
Male. — Length 12-17 mm. Body color like that of female, but tending to be slightly more extensively marked with black and yellow; ocellar triangle black, the black extending downward, sometimes reaching bases of antennae; anterior margin of mesoscutum, postnotum, and various sutures on thorax often marked with black; lower front, outer orbits, pronotal margin, center of metanotum, rim of propodeum, and tegulae often yellowish; abdomen as in female; apical several segments of antennae infuscated, but extreme tip pale. Color of wings and of pubescence and erect hair as in female. Clypeus 2.1-2.3 X as

wide as high, its apical margin rounded. Head 1.2-1.35 X as wide as high; vertex evenly arched above eye tops; eyes very broad. MID .52-.57 X TFD; UID .85-.90 X LID; POL slightly less than OOL. Third antennal segment equal to slightly over half UID. Propodeal slope rather even, its sides barely protuberant. Longer spur of hind tibia .6 the length of the basitarsus. Genitalia with the parameres very slender throughout, the aedoeagus with two large, flaring apical lobes (as figured for *a. algidus* by Evans, 1950, fig. 43).

Distribution. — Available specimens of this form range from Nicaragua to Nayarit, San Luis Potosi, and southern Texas. Intergrades with the very similar *fervidus* should be looked for in Costa Rica and adjacent countries. (Map 37.)

Specimens examined. — 16 ♀♀, 12 ♂♂. NICARAGUA: 1 ♀, Slope Volcan Cosiguina, 6 July 1932 (M. Willows) [CAS]. MEXICO: 1 ♀ (no further data) [ANSP]. VERACRUZ: 1 ♀, Orizaba [BMNH]; 1 ♂, Minatitlan, 26 Aug. 1961 (RRD) [MSU]. MORELOS: 1 ♀, Cuernavaca, 21 Oct. 1922 (E. G. Smyth) [USNM]; 2 ♂♂, Canyon de Lobos, nr. Yautepec, 4000 feet, 25 May 1959 (HEE) [CU, MCZ]; 1 ♀, Alpuyec, 3 July 1951 (HEE) [MCZ]. GUERRERO: 1 ♀, Rincon, 2800 feet, Oct. (HHS) [BHNH]; 1 ♂, 6 mi. N Taxco, 5500 feet, 19 June 1959 (HEE) [MCZ]. JALISCO: 2 ♀♀, 2 ♂♂, Guadalajara, July, Sept. (HEE, RRD) [CU, MCZ, MSU]; 3 ♀♀, 8 mi. S Guadalajara, Sept. 1954 (FXW) [CAS]; 2 ♀♀, San Juan Lagos, 27 July 1951 (HEE, PDH) [MCZ, CIS]. NAYARIT: 1 ♀, 2 ♂♂, Ahuacatlan, 18-22 July 1951 (HEE) [MCZ]. SAN LUIS POTOSI: 1 ♂, 5 mi. E Ciudad del Maiz, 4700 feet, 22 Aug. 1954 [KU]. TEXAS: 2 ♂♂, Port Isabel, Cameron Co., 23-27 June 1956 (HEE) [MCZ]; 1 ♀, 1 ♂, Bexar Co. (H. B. Parks) [MCZ]; 1 ♀, Kingsville (C. T. Reed) [MCZ].

Variation. — The two males from Cameron Co., Texas, have the wings unusually dark, somewhat violaceous, perhaps indicating an introgression of genes from *a. algidus*, although in all other respects they are typical *marcidus*. Similarly, the two females from San Juan Lagos, Jalisco, and to a lesser extent those from Guadalajara, have the wings rather pale and luteous, much as in *willistoni*, but the abdomen is not colored as in that form. A broad band of intergradation may be found to occur between each of the subspecies.



***Poecilopompilus algidus willistoni* (Patton)**

Pompilus willistoni Patton, 1879, Bull. U. S. Geol. Survey, 5: 352 [Type: ♀, KANSAS: Northwestern part, 8 Sept. 1877 (S. W. Williston) (no longer extant)].

Poecilopompilus algidus marcidus Evans, 1950, Trans. Amer. Ent. Soc., 75: 243-245 (in part).

Although I placed *willistoni* in the synonymy of *marcidus* in 1950, it now seems to me desirable to employ Patton's name to apply to the rather characteristically colored population inhabiting the western Great Plains and the northwestern parts of Mexico. This subspecies is intermediate in color between *marcidus* and *coquilletti* and its range is interposed between that of those two forms.

Female.—Length 16-21 mm. Body predominantly castaneous, as in *marcidus*, but yellow maculations more extensive; clypeus and lower front suffused with yellowish, also outer orbits to some extent; collar and posterior pronotal margin marked with yellow, also center of metanotum and often part of scutellum; sides of posterior rim of propodeum yellow; tibiae streaked with yellow, and tarsi mostly yellowish; T3-5, and often much of 2 and 6, largely yellowish, except the tergites tending to have darker apical bands; last few segments of antennae blackish, front with some black in ocellar triangle, some-

times also in center of front and along clypeo-frontal suture, thorax often also suffused with blackish in small part, especially along the sutures. Wings brownish, occasionally weakly violaceous, strongly suffused with yellowish at least along costal margin of fore wing, often more extensively, but never as brilliantly or extensively orange-yellow as in *coquilletti*. Head measurements as in *marcidus*. Propodeum sloping rather evenly, not or barely produced latero-posteriorly. Other features as described for *marcidus*.

Male. — Length 11-16 mm. Color similar to that of female, abdomen largely yellowish beyond segment two (sometimes segment one) but the segments margined apically with castaneous; black markings somewhat more extensive than in female, the black in the ocellar triangle extending down to antennal sockets as a pair of streaks, usually confluent below thorax and leg-bases suffused with a variable amount of black, especially along sutures, mesosternum mostly or wholly black. Wing color as in female. Head measurements within the ranges of variation expressed for *marcidus*; POL often considerably less than OOL. Propodeum at most slightly, roundly swollen posterolaterally.

Distribution. — Baja California and Durango north through Arizona and New Mexico to Colorado and South Dakota. The records of *marcidus* from the United States (except those from Texas) presented by Evans (1950) apply to *willistoni*. Since 1950, I have collected specimens in Scott Co. and Kearny Co., in western Kansas, agreeing closely with Patton's description. East of about the 100 meridian this form is replaced by typical *algidus*. (Map 37.)

Mexican specimens examined. — 1 ♀, 5 ♂♂. BAJA CALIFORNIA: 1 ♂, La Paz, 9 Oct. 1955 (FXW) [CAS]. DURANGO: 2 ♂♂, Nombre de Dios, 6 Aug. 1951 (HEE) [MCZ]. CHIHUAHUA: 1 ♀, 1 ♂, 18 mi. W Jimenez, 10 Aug. 1951 (HEE) [MCZ]; 1 ♂, 18 mi. W Chihuahua, 12 Aug. 1951 (PDH) [CIS].

Poecilopompilus algidus fervidus (Smith)

Pompilus fervidus Smith, 1873, Ann. Mag. Nat. Hist., (4)11: 441 [Type: ♀ BRAZIL: Pará (Bates) (? BMNH)]. — Fox, 1897, Proc. Acad. Nat. Sci. Phila., 49: 246 (Brazil).

Pompilus pygidialis Cameron, 1893, Biol. Centr.-Amer., Hymen. II, p. 210 (Panama; not *pygidialis* Kohl).

Batazonus marcidus Banks, 1925, Bull. Mus. Comp. Zool., 67: 338 (Panama; not *marcidus* Smith).

Batazonus fervidus Banks, 1944, Zoologica, 29: 111 (Br. Guiana). — Banks, 1947, Bull. Mus. Comp. Zool., 99: 376 (Br. Guiana, Brazil, Paraguay, Ecuador, Argentina).

Female. — Length 15-20 mm. Body mostly castaneous, with yellow markings generally brighter than in *marcidus*, present on collar, posterior margin of pronotum, center of metanotum, sides of propodeal rim, and paired spots at base of T3 (sometimes concealed); apical several segments of antennae black, center of ocellar triangle sometimes black, thorax with a limited and variable amount of black, chiefly along the sutures and ventrally, basal abdominal tergites with dark apical margins and first tergite black at extreme base. Wings brownish, occasionally weakly violaceous, with a strong yellowish tinge. Body structure and measurements as described for *marcidus*, but the slope of the propodeum lower, in fact very weak in profile, sides of the slope somewhat prominent.

Male. — Length 10.5-15 mm. Color like that of female, but tending to be more extensively marked with black and yellow; sides of lower front and clypeus, and outer orbits, suffused with yellowish, black in ocellar triangle giving rise to a pair of black streaks which usually do not reach the antennal sockets; yellow on metanotum often extending onto sides of scutellum and upper part of metapleura; antennae dark apically, but tip of apical segment pale. Wings as in female but tending to be slightly paler. Measurements and structural details, including genitalia, as in *marcidus*, except propodeal slope very low, very weakly arching in profile.

Distribution. — This subspecies ranges over the greater part of South America. Specimens from Argentina show no noteworthy differences from those from Panama. (Map 37.)

Central American specimens examined. — 4 ♀ ♀, 3 ♂ ♂. PANAMA: 1 ♀, Bugaba (GCC) [BMNH]; 1 ♀, 3 ♂ ♂, Balboa, Jan., June, Nov. (T. Hallinan) [AMNH, MCZ]; 1 ♀, Ancon, Canal Zone, 4 Aug. 1924 (NB) [MCZ]; 1 ♀, Barro Colorado Isl., Canal Zone, 18 Mch. 1952 (CWR) [KSU].

Poecilopompilus badius new species

Holotype. — ♀, PANAMA: Barro Colorado Island, Canal Zone, 31 July 1956 (CWR) [KU].

This striking species is known to me from only four specimens. The claws are dentate throughout and the marginal cell of the fore wing unusually large and acute, characters which are shared with *decedens* (Smith) from northern South America. However, that species is very differently colored, slightly larger, and has the slope of T1 considerably stronger.

Description of type female. — Length 14 mm.; fore wing 13.5 mm. Body deep fusco-castaneous, the abdomen almost black; inner orbits with a small

yellow streak, lateral angles of posterior rim of propodeum and a streak on the upper side of the hind coxae yellow; vertex, temples, and upper part of mesopleura lighter castaneous than remainder of head and thorax; coxae fuscous, streaked with pale castaneous; femora fuscous, streaked with pale castaneous above; tibiae and tarsi fusco-castaneous except front legs slightly paler than the others; basal two antennal segments brownish-fuscous, third segment fuscous above, below pale rufo-castaneous like following several segments in their entirety, apical six segments weakly infuscated. Fore wing strongly suffused with light brown basally and on the anterior half, posterior apical portion more weakly suffused with brown; hind wings subhyaline. Body pubescence wholly light, fine but quite conspicuous over entire body; body setae rather short, those on the propodeum and coxae rather pale. Clypeus 2.2 X as wide as high, its apical margin truncate. Head 1.10 X as wide as high; MID .55 X TFD, .83 X HE; UID .63 X LID; antennal segment three 1.20 X UID. Ocelli in a flat triangle, POL and OOL subequal; vertex forming an even arc above eye tops. Pronotum short, its posterior margin angulate. Postnotum broadly concealed on mid-dorsal line. Propodeum sloping rather strongly and evenly from front to rear, declivity not well-defined nor its sides protuberant; corners of posterior rim strongly angulate. Front basitarsus with three comb-spines, the apical one .8 as long as second tarsal segment, but without other strong spines. All tarsal claws dentate. Longer spur of hind tibia .55 X as long as hind basitarsus. Fore wing with marginal cell removed from wing tip by only .62 X its own length, strongly pointed apically; SMC3 1.2 X as long as second, but more strongly narrowed above; basal and transverse median veins interstitial; hind wing with anal vein reaching media a short distance beyond cubital fork. First abdominal tergite with its slope rather low and even, about as in *polistoides*, the slope considerably less strong than in *algidus* or *interruptus* and their subspecies.

Distribution. — Costa Rica to Ecuador. (Map 34.)

Paratypes. — PANAMA: 1 ♀, same data as type except 17 March 1963 [USNM]. COSTA RICA: 1 ♀, Golfito, 29 July 1957 (Truxal and Menke) [LACM]. ECUADOR: 1 ♀, 60 mi. S Guayaquil, Apr. 1963 (L. Peña) [MCZ].

Variation. — The Barro Colorado paratype resembles the type closely in size and in standard measurements. However, it is in part somewhat paler in color; the greater part of the front is nearly black, but the occiput and vertex crest are light castaneous, and there are castaneous markings as a pair of streaks on the mesoscutum, on the sides of the scutellum, and on the upper part of the propodeum. The Costa Rica paratype is considerably larger (length 17.5 mm., fore wing 17 mm.). It is slightly darker than the type, the greater part of the thorax and propodeum being a very deep shade of brown,

almost piceous. In this specimen MID is .53 X TFD, UID .60 X LID, antennal segment three 1.30 X UID, POL very slightly greater than OOL. The Ecuador specimen is similarly colored and has identical standard measurements except that antennal segment three measures only 1.25 X UID; this is the largest of the four specimens (length 20 mm., fore wing 18 mm.).

Poecilopompilus polistoides polistoides (Smith)

Pompilus polistoides Smith, 1855, Cat. Hymen. Brit. Mus., 3: 152 [Type: ♀ BRAZIL: Pará (BMNH, no. 19, 570)]. — Belt, 1874, The Naturalist in Nicaragua, pp. 133-134 (Nicaragua). — Fox, 1897, Proc. Acad. Nat. Sci. Phila., 49: 250 (Brazil).

Batazonus polistoides Banks, 1944, Zoologica, 29: 111 (Br. Guiana). — 1947, Bull. Mus. Comp. Zool., 99: 377-378 (Colombia, Venezuela, Br. Guiana, Brazil, Paraguay, Bolivia).

Batazonus inornatus Banks, 1945, Bol. Ent. Venez., 4: 99-100 [Type: ♀, COLOMBIA: Rio Frio, Magdalena, 13 July 1927 (G. Salt) (MCZ, no. 26, 603)]. — Banks, 1947, Bull. Mus. Comp. Zool., 99: 381. New synonym.

Poecilopompilus polistoides Evans, 1950, Trans. Amer. Ent. Soc., 75: 237.

This form occurs over much of northern South America, but enters southern Central America only sparingly. It is possible that Belt's record applies to *flavopictus*; there is a specimen of *flavopictus* in the British Museum collected by Belt in Nicaragua, but none of *polistoides*. *P. polistoides apicalis* (Banks) (new status) occurs in Paraguay.

Female. — Length 9-15 mm. Body yellow, markings as follows: ocellar triangle black, with a pair of black stripes extending down the front, rarely reaching the antennal sockets, black of ocellar area extending laterad to tops of eyes, medially weakly if at all connected with the occiput, which varies from ferruginous to black; pronotum often with a small amount of black or ferruginous medio-anteriorly; mesoscutum with three longitudinal black stripes, sometimes in part ferruginous; center of scutellum black and/or ferruginous; propodeum sometimes blackish at base, sometimes with a dark median stripe, occasionally extensively blackish; mesosternum sometimes in part black, coxae and femora rarely with a small amount of black, but lateral aspect of thorax almost wholly yellow, legs mostly yellow, with a variable amount of ferruginous; abdomen annulated with yellow and pale ferruginous; scape yellow, flagellum pale ferruginous, somewhat infuscated apically and often also basally. Wings subhyaline, anterior half of fore wing brownish. Pubescence very fine

and pale, such that the yellow parts of the integument appear very smooth and polished. Clypeus about twice as wide as its median length, apical margin shallowly notched medially. Head 1.10-1.15 X as wide as high; MID .60-.64 X TFD; UID .62-.68 X LID; POL subequal to or slightly greater than OOL. Antennal segment three 1.05-1.25 X UID. Pronotum subangulate behind, with a median line; postnotum narrowly concealed on the mid-dorsal line; propodeum sloping strongly, about as in *interruptus*. Front basitarsus with three comb-spines, the apical one about half as long as second tarsal segment, also with a strong spine below the comb-spines. Wings as in the following species. Slope of T1 very low, about as in *flavopictus*.

Male. — Length 7.5-12.5 mm. Color pattern in general similar to that of female; black markings on upper front and vertex prominent, usually connected with the black of the occiput by a median streak; pronotum often with some black or ferruginous toward the sides as well as medially, thorax, propodeum, and legs otherwise as described for female; abdomen annulated with yellow and ferruginous, sometimes mostly dark apically; scape yellow, flagellum ferruginous, dusky on upper side. Wings subhyaline, anterior half of fore wing lightly tinged with brownish or yellowish-brown. Pubescence very fine and pale, as in female, yellow parts of integument appearing highly polished. Clypeus about 1.9 X as wide as high, its apical margin truncate. Head 1.15-1.25 X as wide as high; UID .80-.90 X LID; POL and OOL subequal; vertex passing nearly straight across between eye tops, except ocellar triangle very slightly elevated. Features of thorax as in female; longer spur of hind tibia .73-.80 X length of hind basitarsus. Abdomen slender basally, T1 sloping weakly in lateral view, often barely sloping at all. Genitalia not differing noticeably from those of *flavopictus* and *interruptus*.

Distribution. — South America north of Paraguay and Bolivia, including Trinidad; Central America north to Costa Rica (? Nicaragua). (Map 34.)

Central American specimens examined. — 1 ♂. COSTA RICA: 1 ♂, Pacuare, 7 July 1949 (KWC) [USNM].

Poecilopompilus flavopictus flavopictus (Smith)

Pompilus flavopictus Smith, 1862, Jour. Ent., 1: 396 [Type: ♀, MEXICO (no further data) (BMNH, no. 19, 567)]. — Cresson, 1867, Trans. Amer. Ent. Soc., 1: 97. — Cresson, 1869, Proc. Boston Soc. Nat. Hist., 12: 370 (Orizaba, Mexico). — Smith, 1879, Descr. N. Sp. Hymen. Brit. Mus., p. 156 (Cache, Costa Rica). — Cameron, 1893, Biol. Centr.-Amer., Hymen. II, p. 210, pl. XI, fig. 27 (Guerrero to Panama).

Batazonus flavopictus Banks, 1925, Bull. Mus. Comp. Zool., 67: 388 (Panama). — Banks, 1947, Bull. Mus. Comp. Zool., 99: 378 (Colombia, Surinam).

- Poecilopompilus flavopictus* Bradley, 1944, Notulae Nat., Acad. Nat. Sci. Phila., no. 145, p. 10.
- Poecilopompilus interruptus flavopictus* Evans, 1951, U. S. Dept. Agri., Monogr. 2, p. 927 (Cameron Co., Tex.). — Evans, 1951, Trans. Amer. Ent. Soc., 77: 314.

Although this relatively common Central American wasp is closely related to *interruptus*, I no longer regard it as subspecies of that species, as the range overlaps that of *interruptus dubitatus* to some extent, with no evidence of intergradation. *P. flavopictus ventralis* (Banks) (new status) (= *pulcher* Haupt, new synonym) occurs in Brazil. Several West Indian forms (*mundiformis* Rohwer, *hookeri* Rohwer, and possibly *mundus* Cresson) are at most subspecifically distinct from *flavopictus*.

Female. — Length 8-17 mm. Body color yellow, with a rather variable amount of black as follows: base of clypeus, a pair of stripes from the antennal sockets to the ocellar triangle, the latter black and sending stripes to the tops of the eyes and a median stripe to the occiput, which is also black; pronotum with black on anterior slope, mesoscutum black except for a pair of broad yellow stripes, disc of scutellum black, propodeal disc black basally and to a variable extent laterally and behind, with a median black stripe which is nearly always complete, mesopleura narrowly or fairly broadly black along sutures, sometimes wholly black except for a yellow streak below and above the transverse suture, metapleura varying from mostly yellow to entirely black, mesosternum wholly black; coxae variously patterned with black and yellow, the femora sometimes in part black; basal four or five tergites with broad apical bands which vary from dusky ferruginous to black; legs often partly, sometimes almost wholly ferruginous, the pronotum rarely with some ferruginous markings; scape yellow below, usually black above, antennae otherwise ferruginous except segments two and three usually black above, apical six or seven segments dusky above. Fore wings varying from subhyaline to light brownish, anterior half always strongly suffused with yellowish-brown; hind wings weakly tinged with yellowish-brown. Body pubescence very pale and inconspicuous, such that the yellow parts of the pleura appear strongly polished. Clypeus convex, its apical margin with a weak median emargination, measuring 2.0-2.2 X as wide as its median length. Head 1.10-1.18 X as wide as high; MID .58-.64 X TFD; UID .62-.75 X LID. POL subequal to or slightly greater or less than OOL. Antennal segment three varying from .83 (in very small specimens) to 1.25 X UID. Vertex passing straight across at eye tops or arched very weakly. Pronotum subangulate to subarcuate behind; postnotum narrowly concealed or nearly concealed on the mid-dorsal line; propodeum sloping roundly and evenly, the corners of the posterior rim weakly angular. Front basitarsus with three short comb-spines, the apical one not more than half as

long as second tarsal segment, basitarsus also with some additional strong spines below the comb-spines. All claws dentate. Fore wing with marginal cell removed from wing tip by approximately its own length; SMC3 subequal in length to or shorter than SMC2 (fig. 17). Slope of T1 very low.

Male. — Length 7-13 mm. Body color in general very similar to that of female, including a similar pattern of black and yellow on head, mesoscutum, propodeum, and pleura; basal three to six abdominal tergites with broad apical bands, usually more or less fuscous; legs as in female except femora more often streaked with black; antennal scape yellow, sometimes black above, flagellum orange-brown, somewhat dusky on upper side. Wings subhyaline or lightly tinged with brown, anterior half of fore wing strongly suffused with yellowish-brown. Pubescence inconspicuous, as in female, yellow parts of thorax appearing strongly polished. Head about 1.2 X as wide as high; apical margin of clypeus truncate. UID .80-.95 X LID; POL slightly less than OOL in most specimens; vertex nearly straight, but slightly elevated at the ocellar triangle. Pronotum and postnotum as in female; slope of propodeum low and even, corners of posterior rim weakly subangulate. Longer spur of hind tibia about .8 X as long as hind basitarsus. Abdomen slender basally, the first tergite sloping but weakly in lateral profile. Genitalia not differing in any noticeable way from those of *interruptus*, as figured by Evans, 1950, fig. 44.

Distribution. — Surinam and Colombia north through Central America to Jalisco and to extreme southern Texas. (Map 38.)

Mexican and Central American specimens examined. — 108 ♀♀, 121 ♂♂. PANAMA: 4 ♀♀, 16 ♂♂, Barro Colorado Isl., Canal Zone, Mch.-Aug. [MCZ, KSU, KU]; 1 ♀, Ancon, Canal Zone, Aug. (NB) [MCZ]; 1 ♀, Corozal, Canal Zone, Jan. (C. H. Curran) [AMNH]; 1 ♀, Culebra-Arrijan Trail, Canal Zone, Dec. (T. Hallinan) [AMNH]; 1 ♀, El Valle, Coclé Prov., May (G. B. Fairchild) [MCZ]; 1 ♀, 1 ♂, Cerro Azul, 1000 feet, 18 Sept. 1945 (CDM) [KU]; 7 ♀♀, 4 ♂♂, Bugaba (GCC) [BMNH]; 1 ♀, Volcan de Chiriqui, 2-3000 feet (GCC) [BMNH]. COSTA RICA: 3 ♀♀, Golfito, July, Aug. (AM) [LACM]; 1 ♀, Esquinas, nr. Golfito (P. & D. Allen) [MCZ]; 6 ♀♀, Palmar (P. & D. Allen) [MCZ, USNM]; 1 ♀, Orotina, 1 May 1924 (J. C. Bradley) [CU]; 1 ♀, Monteverde, 1400 meters, 17 Feb. 1963 [KSU]; 1 ♀, nr. S Isidro, 5 May 1944 (Schrader) [USNM]; 2 ♀♀, Los Diamantes (KWC) [USNM]; 1 ♀, 2 ♂♂, Pacuare [USNM]; 8 ♀♀, 6 ♂♂, Turrialba (KWC) [USNM]; 1 ♀, 1 ♂, Cache (H. Rogers) [BMNH]; 1 ♂, 12 mi. SW Cañas, Guanacaste Prov., 27 Feb. 1964 (HEE) [MCZ]; 1 ♂, San José, May 1923 (F. Tristan) [ANSP]. NICARAGUA: 1 ♀, Chontales (T. Belt)

[BMNH]. HONDURAS: 1 ♀, Tegucigalpa, 2 July 1949 [UCD]; 1 ♀, Rosario, San Juancito Mts., 5150 feet, 31 July 1930 [ANSP]; 1 ♀, nr. San Marcos de Colon, 8 Sept. 1963 (CCP) [MCZ]. EL SALVADOR: 1 ♂, San Salvador (KWC) [USNM]; 1 ♀, La Cuba, Nov. (K. A. Salman) [USNM]; 1 ♀, 2 mi. E Quezaltepeque, 24 July 1961 (M. Irwin) [UCD]. GUATEMALA: 1 ♀, 1 ♂, Yepocapa, May, Aug. (H. T. Dalmat) [USNM]; 2 ♂ ♂, Guatemala City, Mch. (C. N. Ainslie) [USNM]; 2 ♂ ♂, Concepcion, 1400 feet, Mch. 1932 (Ainslie) [USNM]; 1 ♀, Antigua, 17 June 1923 (E. G. Smyth) [USNM]; 1 ♂, Guazacapan, 11 Aug. 1952 (RHP) [MCZ]; 1 ♀, Cerro Zunil, 4000 feet (GCC) [BMNH]; 1 ♀, Quirigua (JB) [MCZ]; 2 ♀ ♀, 1 ♂, El Salto, Esquintla, June 1934 (FXW) [MCZ]; 1 ♀, 1 ♂, Moca Guatalon, 1000 meters, Mch. 1931 (JB) [MCZ]; 2 ♀ ♀, 1 ♂ (no further data) [MCZ]; 1 ♀, Variedades, Such., 500 feet, 26 Aug. 1947 (C. & P. Vaurie) [AMNH]. BRITISH HONDURAS: 2 ♀ ♀, Hummingbird Hwy., Stann Cr. Dist., 8 July 1963 (CCP) [MCZ]. MEXICO: 4 ♀ ♀ (no further data) [ANSP]. CHIAPAS: 1 ♀, 17 ♂ ♂, Suchiapa, 18 Aug. 1957 (PDH) [CIS, MCZ]; 1 ♂, Revolution, 9 mi. E Buena Vista, 23 Mch. 1953 (EIS) [CIS]; 2 ♂ ♂, 4 mi. SE Soyalo, 15 Mch. 1953 (EIS) [CIS]. OAXACA: 1 ♂, Donaji, 17 Apr. 1953 (EIS) [CIS]. GUERRERO: 1 ♂, Xucumanatlan, 7000 feet, July (HHS) [BMNH]; 1 ♂, 3 mi. N Taxco, 1 June 1959 (HEE) [MCZ]. JALISCO: 1 ♂, 1 mi. SE La Resolana, 20 Nov. 1950 (RFS) [AMNH]. MORELOS: 2 ♂ ♂, Canyon de Lobos, nr. Yautepec, 25 May 1959, 4000 feet (HEE) [CU, MCZ]; 1 ♀, Huajintlan, 22 Aug. 1958 (RRD) [MSU]; 2 ♀ ♀, Tepoztlan, 26 Sept. 1951 (RRD) [MSU]. YUCATAN: 3 ♂ ♂, No. part (Gaumer) [BMNH]. VERACRUZ: 1 ♂, Cotaxtla, 12 Apr. 1956 (A. Ortega) [ENAC]; 5 ♀ ♀, 2 ♂ ♂, Fortin de las Flores, 14-21 Sept. 1954 (FXW) [CAS]; 1 ♂, Poza Rica, 2 Aug. 1955 (P. & C. Vaurie) [AMNH]; 1 ♀, Cerro Blanco, 4 June 1961 (FPM) [ENAC]; 27 ♀ ♀, 37 ♂ ♂, Minatitlan, 26 Aug.-1 Sept. 1961 (RRD) [MSU]; 1 ♀, Jalapa, 6 Aug. 1961 (RRD) [MSU]; 6 ♀ ♀, 8 ♂ ♂, Acayucan, 23 Oct. 1957 (RRD) [MSU]; 5 ♂ ♂, Orizaba, 12 Aug. 1961 (RRD) [MSU]; 1 ♂, Santiago Tuxtla, 11 Aug. 1956 (RRD) [MSU]. SAN LUIS POTOSI: 1 ♀, 5 mi. E Ciudad del Maiz, 4700 feet, 22 Aug. 1954 [KU]; 1 ♀, Valles, 29 Aug. 1956 (RRD) [RRD]; 1 ♂, Xilitla, 23 July 1954 (RRD) [MSU].



Variation. — It is impossible to analyze all the subtleties of variation in color in this species. Suffice it to say that the variation is often considerable in series from one locality, and that specimens from Colombia show no constant differences from those from Mexico. Most specimens can be distinguished with ease from specimens of the sympatric *p. polistoides* and *interruptus dubitatus* by the characters emphasized in the key.

Poecilopompilus interruptus interruptus (Say)

Ceropales interrupta Say, 1835, Boston Jour. Nat. Hist., 1: 365 [Type: ♂, INDIANA (no longer extant)].

Pompilus navus Cresson, 1867, Trans. Amer. Ent. Soc., 1: 105 [Type: ♀, GEORGIA (ANSP, no. 426)].

Pompilus interruptus Cresson, 1872, Trans. Amer. Ent. Soc., 4: 203 (Texas).

Pompilus ichneumoniformis Patton, 1879, Bull. U. S. Geol. Survey, 5: 351 [Type: ♀, KANSAS, Northwestern part (S. W. Williston) (no longer extant)]. Preoccupied by Smith, 1864. Synonymy by Banks, 1944.

Pompilus ichneumonoides Dalla Torre, 1897, Cat. Hymen., 8: 295 (new name for *ichneumoniformis*).

Poecilopompilus navus Howard, 1901, The Insect Book., pl. XI, fig. 18. — Ashmead, 1902, Canad. Ent., 34: 82.

- Batazonus interruptus* Banks, 1912, Ent. News, 23: 108. — Dreisbach, 1949, Ent. Amer., (n.s.) 29: 38, pl. III, fig. 12.
Poecilopompilus interruptus interruptus Evans, 1950, Trans. Amer. Ent. Soc., 75: 247-251.

This is a common spider wasp over much of the United States, especially the southern half, as well as in northern Mexico. The melanistic forms *cressoni* Banks and *semiflavus* new subspecies (described below from California) show no structural differences from typical *interruptus*, but the Central American and southern Mexican subspecies *dubitatus* is distinctive both in color and in structure.

Female. — Length 11-18 mm. Body color varying from pale ferruginous to fusco-ferruginous, often in part black, with liberal yellow markings; inner and outer orbits marked with yellow, upper front, vertex, and occiput sometimes black; pronotal collar and posterior margin broadly yellow, sides of pronotum sometimes marked with yellow, most of disc ferruginous, often suffused with black; mesoscutum ferruginous and/or black, marked with yellow posteriorly, the yellow often extended forward as a pair of incomplete discal stripes; sides of scutellum and central part of metanotum yellow; propodeum ferruginous and/or black, posterior slope with transverse yellow band or mostly yellow, sides of posterior rim also yellow; metapleura usually blotched with yellow above and below, mesopleura with a subtriangular yellow spot below; coxae ferruginous to black, nearly always marked with yellow at least in small part; trochanters and femora sometimes in part black, legs otherwise mostly ferruginous, tibiae streaked with yellow and tarsal segments broadly annulated with yellow; abdomen ferruginous to more or less fuscous, tergites with narrow to broad basal yellow bands; antennae ferruginous, apical several segments fuscous. Fore wings subhyaline to rather heavily infuscated, always suffused with yellowish at least along the costal margin, often over much of the wing, apical margin of both fore and hind wings with a fuscous band. Body pubescence pale, in general somewhat more conspicuous than in the preceding two species. Clypeus truncate or very weakly concave apically. MID .60-.64 X TFD; UID .65-.72 X LID; antennal segment three subequal to or slightly greater than UID. Vertex elevated in an even arc above eye tops, ocelli situated below top of vertex, in a broad triangle; POL:OOL about as 4:3. Pronotum short, subangulate behind; propodeum sloping rather strongly, somewhat steepened behind, its posterior rim strong, weakly angulate laterally. Front basitarsus with four comb-spines, the apical one .5-.7 X the length of the second tarsal segment, also with one or two strong spines below the comb-spines. Marginal cell of fore wing removed from wing tip by about its own length; SMC3 usually not as wide as second, considerably narrowed above. T1 strongly convex in profile, its anterior face almost vertical.

Male. — Length 8-15 mm. Color pattern similar to that of female, but

yellow and black markings often more extensive; upper front and vertex in considerable part black or ferruginous; yellow markings of thorax as in female, but often covering a greater area; mesoscutum sometimes with incomplete or complete paired yellow stripes; propodeum almost always with a transverse yellow band on the posterior slope; coxae variegated with yellow and ferruginous and/or black; femora ferruginous and/or black, without yellow markings except sometimes an apical spot; abdomen banded much as in female, the yellow bands usually narrower than the ferruginous or fuscous bands, abdomen occasionally nearly unicolorous dull ferruginous or fuscous; scape yellowish, flagellum ferruginous, usually somewhat dusky on upper side. Wing color much as in female, always with a strong tinge of yellowish-brown, the apical margin fuscous. Clypeus about twice as broad as high, its apical margin truncate. Head very wide, 1.2-1.3 X as wide as high; eyes wide, MID only .59-.62 X TFD. UID .90-1.0 X LID; ocelli in a flat triangle, POL subequal to or slightly less than OOL; vertex elevated in a slight arc above eye tops, more strongly humped at the ocellar triangle. Slope of propodeum strong, steepened behind; posterior rim very prominent, its sides subangulate. Longer spur of hind tibia .75 X length of basitarsus. T1 sloping strongly. Genitalia as figured by Evans, 1950, fig. 44.

Distribution. — Transcontinental in the southern part of the United States, north to New Jersey, Ontario, Michigan, South Dakota, Utah, and southern California. In Mexico this form is largely confined to the central plateau, south to Jalisco and Morelos, in these two states and in parts of Veracruz intergrading with *interruptus dubitatus* (Cameron) (see that subspecies for listing and discussion of intergrades). A single typical male of *i. interruptus* has been taken in Chiapas. In northeastern United States a mostly black subspecies, *cressoni* (Banks), occurs, while in the central valley of California a dark form with a mostly yellow abdomen occurs, described below as a new subspecies, *semiflavus*. (Map 39.)

Mexican specimens examined. — 9 ♀♀, 67 ♂♂. NUEVO LEON: 2 ♀♀, 3 ♂♂, 50 mi. SE Monterrey, 13 Oct. 1957 (HAS) [OSU, MCZ]; 1 ♂, Vallecillo, 2-5 June 1951 (HEE) [MCZ]; 1 ♂, China, 18 July 1954 (RRD) [RRD]. COAHUILA: 4 ♂♂, 12 mi. N Hermanas, 11 Aug. 1959 (LS & AM) [UCD, MCZ]; 1 ♀, 23 mi. N Saltillo, 11 Aug. 1959 (AM & LS) [UCD]. CHIHUAHUA: 1 ♀, 25 mi. S Chihuahua, 11 Aug. 1951 (HEE) [MCZ]; 4 ♂♂, 18 mi. W Jimenez, 10 Aug. 1951 (HEE & PDH) [MCZ, CIS]. BAJA CALIFORNIA: 1 ♂, San Antonio, Dist. Sur, 12 July 1919 (G. F. Ferris) [CIS]. DURANGO: 2 ♀♀, 2 ♂♂, 8 mi. S Canutillo, 9 Aug. 1951

(HEE & PDH) [MCZ, CIS]; 1 ♀, 40 ♂♂, 14 mi. NW Ceballos, 4100 feet, 10 Sept. 1963 (HAS) [OSU]. JALISCO: 7 ♂♂, Guadalajara, July, Sept. (HEE, RRD) [MCZ, MSU]; 1 ♂, 1 mi. N Tequila, 19 July 1954 (JWM) [CIS]. SAN LUIS POTOSI: 1 ♀, 5 mi. E Xilitla, 23 July 1954 (J. G. Chillcott) [CNC]. MORELOS: 1 ♂, 3 mi. NW Cuernavaca, 6500 feet, 26 June 1959 (HEE) [MCZ]. CHIAPAS: 1 ♂, 7 mi. SE Soyalo, 27 Mch. 1953 (EIS) [CIS].

Poecilopompilus interruptus dubitatus (Cameron) new combination.

Pompilus interruptus Cresson, 1869, Proc. Boston Soc. Nat. Hist., 12: 370 (Orizaba, Mexico). — Fox, 1894, Proc. Calif. Acad. Sci., (2)4: 99 (Baja California).

Pompilus dubitatus Cameron, 1893, Biol. Centr. Amer., Hymen. II, p. 206 [Type: ♂, MEXICO: VERACRUZ: Atoyac, April (HHS) (BMNH, no. 19, 568)].

Pompilus balteolus Cameron, 1893, *ibid.*, p. 209 [Type: ♀, MEXICO: GUERRERO: Chilpancingo, 4600 feet, Aug. (HHS) (BMNH, no. 19, 569)].
New synonym.

Batazonus balteolus Banks, 1931, Bull. Brooklyn Ent. Soc., 26: 133 (Chichen Itza, Yucatan).

Although the females of this form show constant structural differences from typical *interruptus*, the two are on the whole strikingly similar. Since they are allopatric, with intergrades occurring at points of contact of the ranges (see discussion below), it seems safe to consider *dubitatus* a subspecies of *interruptus*.

Female. — Length 8-16 mm. Body color varying from rich castaneous to blackish, always black on the lower thoracic pleura, coxae, trochanters, at least the basal parts of the femora and a portion of the apical part of the hind tibiae, often much more extensively blackish; abdominal venter suffused with blackish at least in part; pattern of yellow maculations as in *i. interruptus* except as follows: upper part of mesopleura as well as lower banded with yellow; lower part of metapleura and all coxae without yellow; legs with or without yellowish markings; basal yellow bands on abdominal tergites always rather narrow; color of antennae and wings as described for *i. interruptus*, the pubescence also as in that form. Clypeus 2.3-2.4 X as wide as its median length, apical margin distinctly, shallowly notched. MID .57-.65 X TFD; UID .60-.80 X LID; antennal segment three 0.9-1.3 X UID. POL subequal to or slightly exceeding OOL. Front basitarsus with three small comb-spines, the apical one about half as long as second tarsal segment, or slightly less. Other features as described for the nominate subspecies.

Male. — Length 8-13 mm. Body color black, with prominent yellow markings as follows: clypeus, except often black medially, rarely wholly black; inner and outer orbits, narrowly to very broadly; pronotum at least along posterior margin, often also anteriorly and laterally; mesoscutum with at least a posterior spot; sides of scutellum; metanotum; propodeum with a broad posterior band, sometimes almost wholly yellow; mesopleura with a stripe on both lower and upper halves, metapleura usually maculated also; coxae streaked with yellow and middle and hind femora streaked with yellow below, tibiae with some yellow and tarsi often annulated; abdominal tergites with basal yellow bands which vary from very narrow to fairly wide; scape yellowish at least below, flagellum ferruginous, blackish above; legs sometimes with some ferruginous markings. Wings almost clear hyaline, fore wing with a fuscous spot on the outer third of the anterior half, sometimes weakly suffused with brown basad of this spot. Slope of propodeum rather strong, but that of the first tergite slightly less strong than in *i. interruptus*; other features as described for that form.

Distribution. — Panama north to central Mexico and along the coastal plains to Tamaulipas and Sonora. Some aspects of variation and of intergradation with *i. interruptus* are discussed following the distributional data. (Map 39.)

Specimens examined. — 39 ♀♀, 30 ♂♂. PANAMA: 1 ♀, Culebra, Dec. 1914 (T. Hallinan) [AMNH]; 1 ♂, Balboa, Nov. 1914 (T. Hallinan) [AMNH]. COSTA RICA: 1 ♀, Palmar (D. O. Allen) [USNM]; 1 ♂, Liberia, 29 July 1963 (HAS) [OSU]. EL SALVADOR: 3 ♀♀, 1-3 mi. W Quezaltepeque, July 1961 (M. Irwin) [UCD]. HONDURAS: 1 ♀, Zamorano, 21 mi. from Tegucigalpa (T. D. A. Cockerell) [MCZ]. GUATEMALA: 1 ♀, El Salto, Escuintla, 28 June 1934 (FXW) [MCZ]; 1 ♂, Rabinal, 3000 feet, 3 Aug. 1947 (C. & P. Vaurie) [AMNH]. MEXICO: YUCATAN: 4 ♀♀, Chichen Itza, June 1929 (JB) [MCZ]; 4 ♀♀, No. part (Gaumer) [BMNH]. CHIAPAS: 1 ♂, nr. Chiapa de Corzo, 3 May 1959 (HEE) [MCZ]; 2 ♂♂, Suchiapa, 18 July 1957 (PDH) [CIS]. OAXACA: 1 ♀, 14 mi. NE Juchitan, 18 July 1952 (EG & CM) [CIS]; 1 ♀, Palomares, 5 Sept. 1961 (RRD) [MSU]. VERACRUZ: 1 ♂, Atoyac, April (HHS) [BMNH]; 3 ♀♀, Medellin (H. T. Heyde) [USNM]; 3 ♀♀, Minatitlan, 26 Aug. 1961 (RRD) [MSU]. TAMAULIPAS: 1 ♀, 8 ♂♂, Villagran, 7 June 1951 (HEE, PDH) [MCZ, CIS]; 1 ♀, 18 mi. E Ciudad Mante, 13 Aug. 1959 (LS & AM) [UCD]. SAN LUIS POTOSI: 1 ♂, Picolco, 21 May 1952 (WG) [AMNH]; 1 ♀, El Salto, 1800 feet, 9 June 1961 [KU]. MORELOS: 4 ♀♀, 2 ♂♂, Alpuyeca,

May, July (HEE) [MCZ, CU]; 1 ♂, Canyon de Lobos, nr. Yautepec, 25 May 1959, 4000 feet (HEE) [MCZ]; 1 ♀, Xochicalco, 13 July 1961, 4000 feet (RRD) [MSU]; 1 ♀, Cuernavaca, 9 July 1961 (RRD) [MSU]. GUERRERO: 1 ♀, 2 ♂♂, Chilpancingo, 4600 feet, Aug., Oct. [BMNH, MCZ]; 1 ♀, Mexcala, 29 June 1951 (HEE) [MCZ]. JALISCO: 1 ♂, 25 mi. W Guadalajara, 4700 feet, 29 Sept. 1957 (HAS) [OSU]. NAYARIT: 1 ♀, 1 ♂, Ahuacatlan, 18 July 1951 (HEE, PDH) [MCZ, CIS]; 1 ♀, 18 mi. S Tepic, 7 July 1963 (LS) [UCD]. SINALOA: 1 ♂, Piaxtla, 19 Aug. 1954 [MCZ]; 1 ♀, 2 ♂♂, Mazatlan, 19 July 1959 (HEE) [MCZ, CU]; 3 ♂♂, 8 mi. S Elota, 2 July 1963 (FDP) [UCD]. SONORA: 1 ♀, 10 mi. E Nava-joa, 13 Aug. 1959 (Werner & Nutting) [MCZ]. BAJA CALIFORNIA: 1 ♀, La Paz, 10 Oct. 1955 (FXW) [CAS]; 1 ♂, La Paz, 27 June 1919 (G. F. Ferris) [CIS].

Intergrades with interruptus interruptus. — MEXICO: MORELOS: 2 ♀♀, Alpuyeca, 27 June, 3 July 1951 (HEE) [MCZ]; 2 ♂♂, Canyon de Lobos, nr. Yautepec, 25 May 1959 (HEE) [MCZ]. JALISCO: 1 ♂, 1 mi. N Tequila, 19 July 1954 (JWM) [CIS]. VERACRUZ: 4 ♀♀, 10 ♂♂, Minatitlan, 26 Aug. 1961 (RRD) [MSU].

Variation. — It will be noted that all the intergrades are from or near localities where *dubitatus* has also been taken. The two Alpuyeca females agree closely in coloration with the *dubitatus* females from that locality, having the coxae wholly black, the apices of the hind tibiae black, and the abdominal venter strongly infuscated; however, the mesopleura are immaculate above, the clypeus is not emarginate, and there are four comb-spines on the front basitarsus. The males from Morelos and Jalisco listed as intergrades are all typical *dubitatus* except that the wings are extensively tinged with yellowish-brown (although much less so that the *i. interruptus* males listed from Morelos and Jalisco).

The series from Minatitlan, Veracruz, is most interesting. Three females are perfectly typical *interruptus dubitatus* and are so listed above, while four other females provide a mixture of characters of *dubitatus* and *i. interruptus*. These four females have four comb-spines on the front tarsus, but the basal one is small; the clypeus is but slightly notched, but the coxae are almost black. All of the ten males taken at the same locality appear closer to *i. interruptus* than to



dubitatus. In these males the wings vary from weakly to rather strongly tinged with yellowish, the mesopleura is without yellowish markings on the upper half except in one specimen, and the middle and hind coxae are entirely without yellow maculations.

The females listed above from Chichen Itza, Yucatan, and from Guatemala and Costa Rica are wholly black (except for the usual yellow maculations) and average smaller than the remainder of the available specimens (all of which have much of the head and thoracic dorsum castaneous). However, the females from Panama and Honduras are extensively castaneous and rather large, and males from the southern parts of the range do not differ consistently from those from Mexico. It is conceivable that these small, dark females represent a different species or subspecies, but I think not. The type of *balteolus* is extensively castaneous, so this name cannot be used to apply to the black females if these prove to be distinct.

Poecilopompilus interruptus semiflavus new subspecies.

Poecilopompilus interruptus interruptus Evans, 1950, Trans. Amer. Ent. Soc., 75: 247-251 (in part; central California specimens).

Holotype. — ♀, CALIFORNIA: Davis, 20 Sept. 1939 (FDP) [CAS].

The color pattern of specimens of *interruptus* from the Central Valley of California is consistently and strikingly different from that of specimens from other parts of the range. Although this form does not occur in Mexico, I take this occasion to provide a name for it.

Description of type female. — Length 14 mm.; fore wing 13 mm. Head and thorax black, with yellow maculations as follows: clypeus except medio-basally; face; inner orbits broadly; outer orbits broadly (the yellow stained with ferruginous behind); pronotal collar, posterior margin, and extreme sides; sides of scutellum; center of metanotum; propodeum with a transverse posterior band and also yellow on sides of posterior rim; lower part of mesopleura with a small spot; abdomen mostly yellowish, tergites black only at extreme base (much of this concealed by overlapping of tergites), except T1 with some dark markings in the center, this tergite stained with ferruginous apically, following tergites with apical margins somewhat ferruginous; legs with coxae, trochanters, and basal parts of femora black, tibiae streaked with yellow and tarsi broadly annulated with yellow, elsewhere ferruginous; antennae ferruginous except apical several segments strongly infuscated. Fore and hind wings strongly suffused with yellowish-brown, their apical margins with a fuscous band, the fuscous extending, in the fore wing, through SMC2 and 3 and the first discoidal cell. Body pubescence conspicuous, silvery to cinereous. Clypeus truncate, measuring 2.3 X as wide as high. Head 1.14 X as wide as high; MID .60 X TFD; UID .69 X LID; antennal segment three subequal to UID; POL slightly exceeding OOL. Other features as described for *i. interruptus*, the front basitarsus with four comb-spines as in that form.

Allotype. — ♂, CALIFORNIA: same data as type except collected 27 Sept. 1959 [CAS].

Description of male allotype. — Length 13 mm.; fore wing 12 mm. Color pattern almost exactly like that of female; scape yellow, flagellum bright rufo-castaneous, dusky on upper side; wing coloration as in female. Pubescence pale, cinereous to light brown; head, pronotum, and propodeum with abundant short, pale setae. Head 1.27 X as wide as high; MID .57 X TFD; UID .92 X LID; POL and OOL subequal. Other features as described for *i. interruptus*.

Paratypes. — CALIFORNIA: 8 ♀ ♀, 1 ♂, Davis, June, Sept. [UCD, MCZ]; 3 ♀ ♀, 10 ♂ ♂, Woodland, July-Sept. (A. T. McClay) [MCZ, UCD]; 1 ♀, Kerman, Fresno Co., 31 Aug. 1960 (R. Snelling) [CIS]; 10 ♀ ♀, 11 ♂ ♂, Artois, Glenn Co., July 1952 (JWM) [CIS, USNM, MCZ]; 1 ♀, Stevenson, Merced Co., 21 Aug. 1960 (R.

Snelling) [CIS]; 1 ♀, 1 ♂, Watts Valley, Fresno Co., 23 June 1956 (R. O. Schuster) [CIS]; 1 ♀, Dos Palos, Merced Co., 2 Sept. 1947 (V. Stern) [CIS]; 1 ♀, Vallejo, Solano Co., 31 Aug. [CIS]; 1 ♂, Patterson, Stanislaus Co., 22 June [CIS]; 1 ♀, 1 ♂, Turlock, Stanislaus Co., July (R. Snelling) [CIS].

Variation. — The females vary in length from 11 to 15 mm., the males from 9 to 14 mm. The range in variation in standard measurements is virtually the same as expressed for *i. interruptus*. The color pattern is remarkably constant. In the females there is some variation in the amount of ferruginous staining on the outer orbits, and there may be some on the front, clypeus, and pronotum; in some specimens there are yellow markings on the mesoscutum. The males, as a group, tend to have the wings slightly paler and more irregularly infuscated than do the females. Some males have ferruginous stains on the pronotum and/or scutellum, and some have yellow markings on the posterior part of the mesoscutum. Several males have very limited yellow markings on the coxae. One male is extensively blotched with black in the central parts of T1 and T2.

Genus **TACHYPOMPILUS** Ashmead

Tachypompilus Ashmead, 1902, Canad. Ent., 34: 83 [Type: species: *T. abbotti* Ashmead (= *analisis* Fabr.), monobasic]. — Evans, 1950, Trans. Amer. Ent. Soc., 75: 253-268 (revision of U. S. spp.).

Arachnophroctonus Ashmead, 1902, Canad. Ent., 34: 83 [Type species: *Ceropales ferruginea* Say, monobasic]. Preoccupied by Howard, 1901. — Banks, 1912, Jour. N. Y. Ent. Soc., 19: 224. — Banks, 1947, Bull. Mus. Comp. Zool., 99: 381-385 (So. American spp.).

Balanoderes Haupt, 1929, Mitt. Zool. Mus. Berlin, 15: 119, 155 [Type species: *Sphex analis* Fabr., designated by Haupt, 1929]. Synonymy by Haupt, 1930.

Afropompilus Arnold, 1936, Ann. Transvaal Mus., 18: 107 [Type species: *Pompilus ignitus* Smith, 1955; original designation]. Synonymy by Evans, 1950.

Zarachnophroctonus Pate, 1946, Trans. Amer. Ent. Soc., 72: 130 (new name for *Arachnophroctonus* Ashmead, not Howard). Synonymy by Evans, 1950.

Generic characters. — Size 7-30 mm.; body color predominantly rufo-castaneous, with variable amounts of black, rarely mostly black; wings hyaline, yellowish, or fuscous, sometimes banded; pubescence very fine, inconspicuous, erect setae sparse to moderately abundant. Mandibles with one or two teeth

on the inner margin. Labrum protruding from beneath clypeus to some extent, rounded and with an apical slit. Clypeus large, rather convex, its apex truncate or emarginate. Malar space present, rather short. Front distinctly tuberculate medially just above the bases of the antennae, more particularly so in the female. Antennae elongate, segment three in the female always much longer than four. Front relatively narrow. Pronotum short, arcuate or subarcuate behind; postnotum a nearly linear transverse band, not expanded on each side of the median line as in *Poecilopompilus*. Propodeum with the declivity distinct, rather flat, sides of the declivity usually humped or ridged, sometimes tuberculate. Legs very long and slender; front tibiae without spines above; female with a tarsal comb. Pulvillar comb weak, of at most about 12 setulae. Claws of female dentate, those of male bifid; inner claws of front tarsi of male more curved than outer and the rays more widely separated, apical segment of front tarsus weakly asymmetrical. Wings not folded longitudinally in repose; fore wing with stigma large, marginal cell long, less than its own length from wing tip, third discoidal cell also less than its own length from wing margin; SMC2 and 3 both rather wide above; hind wing with anal vein arching up to meet media at or near the cubital fork (fig. 18). Abdomen of female stout, not bristly apically. Male SGP strongly keeled, subacute apically. Genitalia with the parameres very slender; basal hooklets single or weakly doubled; digitus with a transverse fold about midway, beyond which it is strongly setose; aedeagus bearing setae (see figs. 67 and 68 in Evans, 1950).

Distribution. — This genus is well represented in the Ethiopian and Oriental regions. In the Americas, the species collectively range from northern United States and British Columbia to Peru and Argentina, including the West Indies.

Included species. — Evans (1950) recognized two polytypic species in the United States, both entering northern Mexico. Banks (1947) recognized ten species in South America, two also occurring in Central America. The Mexican and Central American species present a somewhat confusing picture, both nomenclatorially and zoologically. The name *torridus* must be shifted from the species called by that name by Banks and myself and applied to a member of the *ferrugineus* complex. I was also in error in placing the name *annexus* Banks in synonymy with *burrus* Cresson. Tentatively, I recognize three species in Mexico and Central America, two of them polytypic. The key which follows includes all known subspecies of these species, but extralimital ones are not treated in the text.

Key to Species

1. Wings luteous, with two prominent dark bands in addition to the dark apical margin; propodeum of female with a pair of dentiform processes on the sides; male with the malar space nearly half as long as the width of the mandibles at their base (South America, Panama) *mendozae* (Dalla Torre)
 Wings at most lightly tinged with luteous and at most weakly banded; propodeum at most somewhat roundly prominent on the sides of the declivity 2
2. Female: antennal segment three equal to from .9 to 1.2 X UID; eyes more widely separated at top, UID .85-1.0 X LID. Male: eyes distinctly diverging above, UID 1.05-1.15 X LID; antennal segment three not more than twice as long as its greatest width (*unicolor*) 3
 Female: antennal segment three equal to at least 1.3 X UID; eyes more strongly convergent above, UID .72-.86 X LID. Male: eyes not or barely diverging above, UID .90-1.03 X LID; antennal segment three more than twice as long as wide (*ferrugineus*) 4
3. Wings wholly infuscated, somewhat violaceous, usually slightly darker along outer margin but less contrastingly so than below; males often (and females occasionally) with a considerable amount of black on thorax and propodeum (western U. S. and Br. Columbia) *unicolor unicolor* (Banks)¹⁶
 Wings flavo-hyaline or nearly clear hyaline, the outer margin narrowly infuscated; body usually nearly uniformly rufo-castaneous (Costa Rica to southwestern U. S.) *unicolor cerinus* n. subsp.
4. Abdomen uniformly rufo-castaneous, except base of first tergite black, none of tergites with their apical margins fuscous 5
 Abdomen with first two tergites distinctly annulated with fuscous apically 8
5. Thorax and propodeum wholly black, head mostly black; wings moderately infuscated, with a darker band over the basal vein and a broad dark band extending from the marginal cell to the posterior wing margin (Haiti) *ferrugineus bicolor* (Banks)
 Head, thorax, and propodeum rufo-castaneous, with very limited black markings; wings variable 6
6. Wings dark fuscous, violaceous; third antennal segment of female more than twice as long as UID (Jamaica) *ferrugineus erythrus* (Smith)
 Wings at most moderately tinged with brownish; third antennal segment of female not twice as long as UID 7
7. Wings nearly hyaline, those of the female weakly twice-banded in addi-

¹⁶ This form is common in San Diego Co., Calif., and must surely occur in northern Baja California. It was treated by Evans (1950) under the name *torridus unicolor*.

- tion to the dark apical margin; clypeus of female strongly emarginate (Cuba) *ferrugineus uniformis* (Cresson)
- Wings lightly to moderately tinged with brownish, rarely with any evidence of banding except for dark outer margin; clypeus of female moderately emarginate (southern Mexico to Arizona and western Texas) *ferrugineus torridus* (Smith)
8. Meso- and metapleura and propodeum largely or wholly black; wings fuscous, violaceous, without evidence of banding 9
- Meso- and metapleura in large part or wholly rufo-castaneous; propodeum at most black along a broad median band; wings variable 10
9. Head and thorax almost entirely black; mesonotum black, usually also the pronotum and coxae; femora often partly black (northeastern U. S.) *ferrugineus nigrescens* (Banks)
- Head and thorax in large part rufo-castaneous; pro- and mesonota mostly or wholly rufo-castaneous, femora entirely so (Florida and Texas to Minn. and N. J.) *ferrugineus ferrugineus* (Say)
10. Propodeum usually completely without black markings; wings fuscous, violaceous, without evidence of banding; bands on abdominal tergites relatively weak, especially that on second tergite (eastern Texas to Kansas) *ferrugineus annexus* (Banks) ¹⁷
- Propodeum marked with black at least at base and in center of declivity; wings weakly to rather strongly brownish, usually with evidence of banding; bands on first two abdominal tergites very strong 11
11. Wings lightly tinged with yellowish-brown, almost hyaline, banding light but distinct; median black band of propodeum usually not complete (South America, Panama) *ferrugineus affinis* (Banks)
- Wings moderately infuscated, banding usually rather indistinct; median black band of propodeum complete in male, often complete in female (Costa Rica to southern Mexico) *ferrugineus burrus* (Cresson)

Tachypompilus ferrugineus torridus (Smith) new status

Pompilus torridus Smith, 1862, Jour. Ent., 1: 396 [Type: ♀, MEXICO (no further data) (BMNH, no. 19, 740)]. — Cresson, 1869, Proc. Boston Soc. Nat. Hist., 12: 371 (Orizaba, Mex.). — Cameron, 1893, Biol. Centr.-Amer., Hymen. II, p. 211.

Arachnophroctonus torridus Bradley, 1944, Notulae Nat., Acad. Nat. Sci. Phila., no. 145, p. 9.

Arachnophroctonus ferrugineus var. *unicolor* Banks, 1944, Bull. Mus. Comp. Zool., 94: 168 [Type: ♀, ARIZONA: Oak Creek Canyon, 6000 feet (F. H. Snow) (MCZ, no. 25, 730)]. Preoccupied by Banks, 1919. New synonym.

¹⁷ I have taken this form in series in Cameron Co., Texas, and it must surely occur in northeastern Mexico. U.S. records for *burrus* presented by Evans, 1950, apply to this subspecies.

Tachypompilus ferrugineus yavapai Evans, 1950, Trans. Amer. Ent. Soc., 75: 263 (new name for *unicolor* Banks, 1944). — Evans, 1951, U. S. Dept. Agri. Monogr. 2, p. 928. New synonym.

The name *torridus* has been erroneously applied by Banks and myself to the form here called *unicolor cerinus* n. subsp. The type of *torridus* is in good condition and appears to me to be consubspecific with *yavapai* Evans. This form should be regarded as a subspecies of *ferrugineus* despite some interdigitation with the range of *ferrugineus burrus* in Central Mexico. Specimens from western Texas appear to show intergradation with *ferrugineus annexus*, some specimens from central Mexico with *ferrugineus burrus* (see discussion below, under "variation").

Description of type female. — Length 15.5 mm.; fore wing 11.5 mm. Color uniformly rufo-castaneous except as follows: antennae lightly infuscated beyond segment five; extreme sides of scutellum, sides of metanotum, and all of the postnotum blackish; propodeum black along anterior margin and again in lower part of declivity; mesosternum and sutures of meso- and metapleura blackish; extreme base of T1 black, but abdomen otherwise without black markings; wings wholly lightly infuscated, with a faint luteous tinge, apex of fore wing slightly darker. Fine, pale erect setae present on front, vertex, temples, and propleura; propodeum with numerous short, pale setae; apex of abdomen setose above and below; pubescence very fine, pale in color. Clypeus 1.9 X as broad as its median height, apical margin shallowly emarginate. Head 1.07 X as wide as high; MID .55 X TFD, .75 X HE; UID .80 X LID. POL:OOL = 13:12. Third antennal segment about 7 X as long as its maximum thickness, measuring 1.6 X UID. Propodeum with a median linear impression, sides of declivity weakly humped, the declivity concave. Mesosternum with its apical median flaps produced on each side to form short, finger-like processes. Front basitarsus with three comb-spines, the apical one .9 as long as second tarsal segment.

Male. — Length 10-15 mm. Body color as in female, the black on the thorax and propodeum sometimes reduced to only a small area on the mesosternum; antennae lightly infuscated apically; wings lightly to moderately tinged with brownish or yellowish-brown, with a darker apical band, occasionally with a weakly developed band over the marginal cell and extending back toward the posterior wing margin. Clypeus 1.6-1.8 X as wide as high, its apical margin truncate. Front narrow, MID considerably exceeding LID, but tops of eyes convergent such that UID measures from 0.9 to 1.0 X LID. POL slightly exceeding OOL. Temples very narrow. Antennae elongate, segment three 2.0-2.5 X as long as wide. Sides of propodeal declivity roundly protuberant. Genitalia as figured for *f. ferrugineus* by Evans, 1950, fig. 67.

Distribution. — Southern California to western Texas, south

through Baja California and through the Mexican highlands to Chiapas. For U. S. records, see Evans, 1950, as *yavapai*. (Map 40.)

Mexican specimens examined. — 15 ♀♀, 18 ♂♂. BAJA CALIFORNIA: 1 ♀, Las Animas, Sierra Laguna, 12 Oct. [CAS]; 2 ♂♂, 25 mi. W La Paz, Sept. 1959 (Radford & Werner) [UA]; 1 ♂, 15 mi. N San Ignacio, 29 Sept. [CAS]. CHIHUAHUA: 1 ♀, Chihuahua, 12 Aug. 1951 (HEE) [MCZ]. DURANGO: 1 ♀, 10 km. N Nombre de Dios, 5 Aug. 1951 (HEE) [MCZ]; 2 ♂♂, 8 mi. S Canutillo, 9 Aug. 1951 (HEE) [MCZ]. MORELOS: 2 ♀♀, Cuernavaca, Apr., May, 1959 (HEE) [CU, MCZ]; 1 ♀, Alpuyecá, 27 June 1951 (HEE) [MCZ]. PUEBLA: 2 ♀♀, 9 ♂♂, Cacaloapan, 26 Apr. 1962 (FDP) [UCD, MCZ]. VERACRUZ: 2 ♀♀, 1 ♂, Orizaba [BMNH, ANSP]; 1 ♀, 1 ♂, Orizaba, Aug. 1961 (RRD) [MSU]. CHIAPAS: 2 ♂♂, 28 mi. W Cintalapa, 9 Apr. 1962 (FDP) [UCD]. Without specific locality data: 4 ♀♀ [BMNH].

Variation. — The females vary in length from 12 to 22 mm. The clypeus varies from 1.76-2.00 X as broad as its median height; antennal segment three varies from 1.5 to 1.7 X UID; there may be either three or four comb-spines on the front basitarsus. As in the males, some females (especially those from Arizona) have no black at all on the thorax except for part of the mesosternum. In some specimens of both sexes the apical margins of the first two tergites are lightly and indistinctly banded with fuscous. This is especially true of specimens from western Texas and from central Mexico. Specimens from western Texas (Davis Mts. and Chisos Mts. [MCZ]) also have the wings generally darker than in *torridus* and are thus perfect intermediates between *ferrugineus torridus* and *f. annexus*. Several specimens from central Mexico which appear to represent intergrades between *torridus* and *burrus* are considered under the latter form.

Tachypompilus ferrugineus burrus (Cresson)

Pompilus torridus var. *burrus* Cresson, 1869, Proc. Boston Soc. Nat. Hist., 12: 371 [Lectotype: ♀, MEXICO: VERACRUZ: Veracruz (C. Sartorius) (ANSP, no. 429)].

Pompilus virulentus Smith, 1879, Descr. N. Sp. Hymen. Brit. Mus., p. 155 [Type: ♀, COSTA RICA: Irazu, 6000-7000 feet (H. Rogers) (BMNH, no. 19, 741)]. — Cameron, 1893, Biol. Centr.-Amer., Hymen. II, p. 210 (Yucatan). New synonym.

Arachnophroctonus cockerellae Rohwer, 1914, Proc. U. S. Nat. Mus., 47: 515

[Type: ♂, GUATEMALA: Gualan, 12 Feb. 1912 (W. P. Cockerell) (USNM, no. 16, 028)]. New synonym.

Arachnophroctonus virulentus Banks, 1931, Bull. Brooklyn Ent. Soc., 26: 133 (Yucatan).

Arachnophroctonus torridus var. *burrus* Bradley, 1944, Notulae Nat., Acad. Nat. Sci. Phil., no. 145, p. 9.

Tachypompilus ferrugineus burrus Evans, 1950, Trans. Amer. Ent. Soc., 75: 262-263 (in part; *annexus* Banks erroneously considered synonym).

The type specimens of *burrus* and *virulentus* are both in excellent condition and are very similar (see below, under "Variation"). Although Banks' *annexus*, from Texas, is also similar, this form is consistently paler, although with darker wings, and also has the clypeus generally broader (about twice as broad as its median height). Although I formerly considered *annexus* a synonym of *burrus*, it now seems to me desirable to consider the two as distinct subspecies. Presumably the ranges of these two forms are in contact somewhere in Tamaulipas or northern Veracruz.

Description of type female. — Length 16 mm.; fore wing 13.5 mm. Color dark rufo-castaneous except as follows: antennae somewhat infuscated on apical half; extreme anterior margin of mesoscutum, sides of scutellum at base, sides of metanotum, and all of postnotum black; basal median portion of propodeum black, also greater part of the declivity, but the two black areas well separated; mesosternum and sutures of pleura blackish; extreme base of T1 black, also apical margins of T1 and 2 with strong black bands. Wings moderately heavily infuscated, weakly violaceous, fore wing slightly darker over the basal vein, again at the second intercubital vein, and again at the apex of the wing. Pubescence and erect hairs as in *torridus*. Clypeus 1.78 X as broad as its median height, apical margin shallowly emarginate. MID .53 X TFD; UID .85 X LID; antennal segment three 1.65 X UID; POL:OOL=9:8. Sides of propodeum declivity distinctly humped. Mesosternum with its apical median flaps simple, only very slightly produced on each side.

Male. — Length 11-15 mm. Coloration similar to that of female; antennae weakly infuscated apically, or sometimes the entire flagellum strongly infuscated; vertex with a small amount of black in and laterad of the ocellar triangle; black of thorax slightly more extensive than in female, anterior fourth of mesoscutum black, black of scutellum usually connected across the base of the scutellar disc; propodeum with a broad, usually complete median black band; abdomen as in female. Wings as in female except slightly more lightly infuscated, sometimes almost hyaline, the darker banding at the basal vein, the second intercubital vein, and the outer wing margin usually quite distinct, although not intense. Clypeus about 1.7 X as wide as high, truncate below; other features of head exactly as described for *torridus*. Posterolateral angles

of propodeum roundly protuberant.

Distribution. — Costa Rica to Veracruz, state of Mexico, Morelos, and Guerrero. The specimens from Guerrero and the state of Mexico, and most of those from Morelos, have the wings unusually pale and with little evidence of banding, and are probably best interpreted as intergrades with *ferrugineus torridus* (see below). South of Costa Rica *burrus* is replaced by subspecies *affinis* Banks. The male from Colombia assigned by Banks (1947) to *virulentus* is in my opinion a male *affinis*. (Map 40.)

Specimens examined. — 23 ♀♀, 3 ♂♂. MEXICO: MORELOS: 1 ♀, 3 mi. NW Cuernavaca, 6500 feet, 28 June 1959 (HEE) [MCZ]. VERACRUZ: 3 ♀♀, Veracruz (C. Sartorius) [ANSP]. TABASCO: 1 ♂, Teapa, March (HHS) [BMNH]. YUCATAN: 1 ♀, Chichen Itza, June 1929 (JB) [MCZ]; 11 ♀♀, 9 ♂♂, Temax (Gaumer) [BMNH]; 1 ♀, 1 ♂, without further data (Gaumer) [KU]. GUATEMALA: 1 ♂, Gualan, 12 Feb. 1912 (W. P. Cockerell) [USNM]. HONDURAS: 1 ♀, Puerto Castilla, 27 March 1924 (JB) [MCZ]. COSTA RICA: 1 ♀, Irazu, 6000-7000 feet (H. Rogers) [BMNH]; 4 ♀♀, Turrialba, June 1949 (KWC) [USNM]; 1 ♂, Pacuare, 7 July 1949 (KWC) [USNM].

Intergrades with ferrugineus torridus. — 9 ♀♀, 1 ♂. MEXICO: MEXICO: 1 ♀, Jilotepec [USNM]. MORELOS: 5 ♀♀, Cuernavaca, May-July [USNM, CU, MCZ]. GUERRERO: 3 ♀♀, 1 ♂, Xucumanatlan, 7000 feet, July (HHS) [BMNH].

Variation. — The type of *virulentus* differs from that of *burrus* in having a complete median black band on the propodeum, and in the following measurements: clypeus 1.9 X as wide as its median height, UID .76 X LID, antennal segment three 1.9 X UID. Of the Costa Rica females before me, the median black band on the propodeum is complete in all but one; in the Honduras female it is nearly complete; in the Mexican females it is always incomplete, although nearly complete in a few. In the entire series of female, the clypeus varies from 1.72 to 1.9 X as broad as high, antennal segment three from 1.4 to 1.9 X as long as UID. The series shows an unusual amount of variation in the development of the mesosternal flaps; typically these are transverse, as in the types of both *burrus* and *virulentus*, but in all of the females from Yucatan these flaps are produced laterally into slender processes, as in *torridus*. This is also the case

with some (but not all) of the specimens listed above as intergrades with *torridus*. Otherwise these intergrades differ from *burrus* in having dark bands at the apices of the first two tergites somewhat weaker than normal (although much more distinct than in *torridus*) and in having the wings very lightly tinged with brownish or yellowish-brown and with little evidence of banding except along the apical margin. The presence of elongated mesosternal flaps in the Yucatan population may indicate that the gene for this character, which is characteristic of *torridus*, may have penetrated much of the *burrus* population in the northern parts of its range.

Tachypompilus ferrugineus affinis (Banks) new combination.

Arachnophroctonus affinis Banks, 1947, Bull. Mus. Comp. Zool., 99: 384 [Type: ♀, BRAZIL: Maracujú, Matto Grosso, Apr.-May 1937 (G. Fairchild) (MCZ, no. 26, 705)].

Arachnophroctonus virulentus Banks, 1947, *ibid.*, p. 384 (♂, COLOMBIA: Muzo, Dept. Boyaca, June (JB); misidentification).

This, the South American representative of the *ferrugineus* complex, occurs also in Panama.

Description of type female.—Length 18 mm.; fore wing 15 mm. Color exactly as described for type of *burrus*, except thoracic pleura more liberally marked with black along the sutures and all coxae with some black; wings lightly tinged with yellowish-brown, much as in *torridus*, but fore wing distinctly although lightly clouded at the basal vein, again at the second intercubital vein, and also along the outer margin. Clypeus 1.82 X as wide as high, its apical margin with a rather strong median emargination. MID .52 X TFD; UID .81 X LID; antennal segment three 1.75 X UID; POL slightly exceeding OOL. Propodeum as in *burrus*, *torridus*, and other members of this complex. Front basitarsus with four comb-spines. Mesosternal flaps roundly produced on each side, less strongly so than in *torridus*.

Male.—Length 9-11 mm. Color as in female except ocellar triangle marked with black, mesoscutum black on anterior fourth, front and middle coxae sometimes without black, trochanters sometimes suffused with black; antennae infuscated on apical third; posterior margin of pronotum and sides of face and clypeus suffused with yellowish; wings as in female. Structure as described for *torridus*; UID .92 X LID; POL:OOL=8:7; anterior margin of clypeus weakly concave. Posterior lateral portions of propodeum strongly, roundly protuberant.

Distribution.—In addition to the type and paratype, from Brazil and Paraguay, there are in the MCZ collection a female from Alausi,



Ecuador, and a male from Muzo, Colombia. (Map 40.)

Central American records. — 18 ♀♀, 5 ♂♂. PANAMA: 14 ♀♀, 5 ♂♂, Barro Colorado Island, Canal Zone, Jan.-July [MCZ, USNM, KU]; 4 ♀♀, Cano Saddle, Canal Zone, May [USNM].

Variation. — The females vary in length from 11.5 to 18 mm. The amount of black on the pleura and coxae is rather variable, but all available females have at least some black on the coxae; one Barro Colorado female has a complete median black band on the propodeum, as is typical of Costa Rica specimens of *burrus*. The development of the mesosternal flaps is also variable, the Panama series tending to have them transverse and at most very slightly produced on the sides. The width of the clypeus of the females varies from 1.72 to 1.86 X the median length. None of the males has a complete median dark band on the propodeum, although the band is nearly complete in some of the Panama specimens.

Tachypompilus unicolor cerinus new subspecies

Tachypompilus torridus torridus Evans, 1950, Trans. Amer. Ent. Soc., 75: 264-266 (*nec* Smith; misidentification). — Evans, 1951, U. S. Dept. Agri., Monogr. 2, p. 928.

This form bears a strong resemblance to *ferrugineus torridus*, with which it is broadly sympatric. In addition to the characters cited in the key, *cerinus* may be recognized by having the vertex slightly more strongly arched above the eye tops and by the generally shorter propodeum, which in the male is considerably more steeply and abruptly declivous behind than in any of the subspecies of *ferrugineus*. The male genitalia of *unicolor* and its subspecies differ from those of *ferrugineus* and its subspecies only in having the aedoeagus somewhat less attenuate apically and bearing somewhat shorter setae (see Fig. 62 in Evans, 1950).

Holotype. — ♀, MEXICO: CHIHUAHUA: Chihuahua, 12 Aug. 1951 (HEE) [MCZ, no. 30, 968].

Description of type female. — Length 12 mm.; fore wing 10.5 mm. Body rufo-castaneous, with limited black markings as follows: sides of metanotum, central portion of postnotum, extreme lower median part of propodeal declivity, extreme base of first abdominal segment, sides of hind coxae at base, mesosternum and anterior margin of mesopleurum; antennae and legs rufo-castaneous except apical third of antennae infuscated and tarsi very weakly infuscated. Wings lightly tinged with yellowish-brown, fore wing with a darker band along outer margin, also with a very faint cloud starting in the center of the marginal cell and extending across the second intercubital vein to the outer half of the third discoidal cell. Pubescence wholly pale and very fine; temples and propleura with dense pale hair, but body otherwise very sparse setose, the propodeum with only a few pale hairs. Clypeus 1.9 X as wide as its median length, apical margin shallowly emarginate. Head 1.06 X as wide as high; front rather broad, MID .60 X TFD, .85 X HE; UID .93 X LID. Vertex evenly arched above eye tops; POL:OOL about as 13:10; third antennal segment measuring 1.05 X UID. Propodeum with only a very weak median impression basally; in profile, basal .4 convex, apical .6 obliquely declivous; sides of declivity very weakly humped. Mesosternal flaps transverse, weakly produced on the sides. Front basitarsus with four comb-spines, the apical one about as long as the second tarsal segment. Wings as in figure 18.

Allotype. — ♂, same data as type [MCZ].

Description of male allotype. — Length 10 mm.; fore wing 9 mm. Inner and outer orbits and pronotal collar and posterior margin somewhat yellowish, body otherwise rufo-castaneous except with limited black markings as in female, but slightly more extensive than in that sex, the sides of the scutellum black, the black of the postnotum extending onto the extreme base of the propodeum, the black of the propodeal declivity extending over much of the posterior rim, the sutures of the meso- and metapleura rather heavily stained with black; propleura wholly black; extremities of antennae and legs stained with fuscous.

Wings as in female except slightly paler and with little evidence of a cloud in and below marginal cell. Pubescence wholly pale and very fine, as in female; body with sparse, pale hairs, propodeum a number of pale hairs on each side. Clypeus 1.75 X as wide as high, truncate below. Head very slightly wider than high; MID .59 X TFD, 1.25 X LID; UID 1.08 X LID. Vertex rather strongly arched above eye tops; POL:OOL about 3:2. First four antennal segments in a ratio of about 17:5:14:14, segment three 1.95 X as long as wide. Temples about half as wide as eye width in lateral view. Propodeum only very faintly impressed medially; declivity oblique, slightly concave in the center, its sides roundly protuberant.

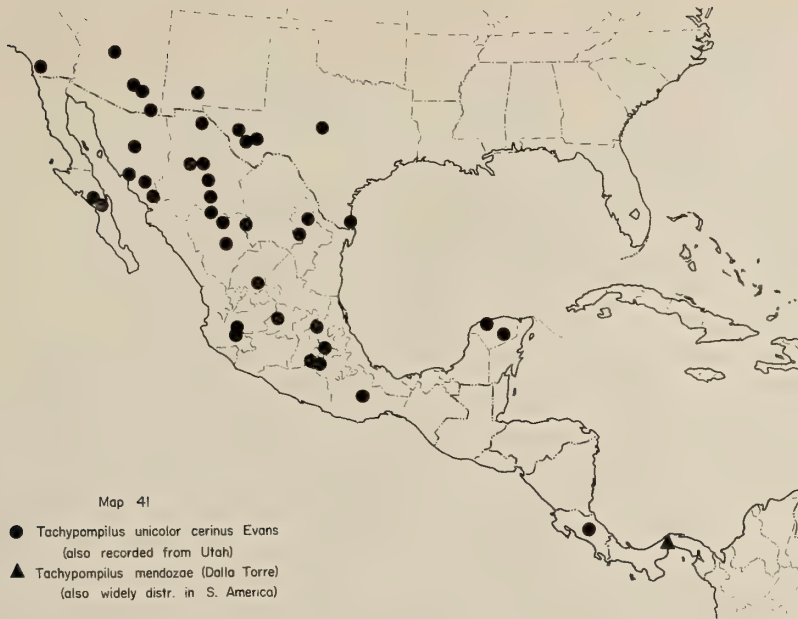
Distribution. — Costa Rica to southern California, Utah, New Mexico, and Texas. Additional U. S. records were presented by Evans, 1950, as *torridus torridus*. Since that date I have seen a female from UTAH: Dugway Proving Ground, Tooele Co., 17 July 1953 [Univ. Utah]. (Map 41.)

Paratypes. — 45 ♀♀, 46 ♂♂. ARIZONA: 1 ♂, 10 mi. NW Congress, Yavapai Co., 30 May 1962 (FDP) [UCD]; 1 ♀, 22 mi. S Mt. View, 19 Oct. 1957 (G. D. Butler) [MCZ]; 1 ♂, Santa Catalina Mts., Bear Canyon, 13 May 1961 (RHP) [MCZ]; 5 ♀♀, 11 ♂♂, Tucson, May, June, Oct. [MCZ, CU, UCD]; 1 ♂, Douglas, 24 July 1937 (W. W. Jones) [USNM]; 1 ♀, 6 mi. W Douglas, 28 July 1948 (HEE) [MCZ]; 1 ♂, Atascosa Mts., 2 Oct. 1938 (R. H. Crandall) [CU]. TEXAS: 1 ♀, Ballinger, 30 Aug. 1924 (RHP) [MCZ]; 1 ♀, Marfa, 20 July 1946 (HEE) [MCZ]; 1 ♂, Alpine, 11 May 1961 (J. E. Gillaspay) [MCZ]; 1 ♂, 6 mi. W Fort Davis, 15 July 1948 (HEE) [MCZ]; 2 ♂♂, Brownsville (J. C. Bridwell) [USNM]; 2 ♀♀, Port Isabel, Cameron Co., June (HEE) [MCZ, USNM]. MEXICO: NUEVO LEON: 1 ♀, Vallecillo, 2-5 June 1951 (HEE) [MCZ]; 1 ♂, 11 mi. W Monterrey, 2800 feet, 15 Oct. 1957 (HAS) [OSU]. CHIHUAHUA: 2 ♀♀, 18 mi. W Chihuahua, 12 Aug. 1951 (PDH) [CIS]; 2 ♀♀, 18 mi. W Jimenez, 10 Aug. 1951 (HEE) [MCZ]; 1 ♂, 25 mi. S Chihuahua, 11 Aug. 1951 (PDH) [CIS]; 1 ♀, Samalayuca, 24 June [AMNH]; 3 ♀♀, 60 mi. S Hidalgo del Parral, 24 Oct. 1957 (HAS) [OSU]. SONORA: 1 ♂, Valle del Yaqui, 16 April 1957 (FPM) [ENAC]; 1 ♂, 16 mi. SE Empalme, 8 May 1953 (EIS) [CIS]; 1 ♀, 28 mi. N Hermosillo, 26 April 1961 (RHP) [MCZ]; 1 ♀, Aduana, 15 Mch. 1962 (LS) [UCD]. BAJA CALIFORNIA: 1 ♂, Mesquital, 22 June [CAS]; 2 ♀♀, 10 mi. E Mesquital, 23 June [CAS]; 3 ♀♀, 20 mi. N Mesquital, 27 Sept. [CAS]. DUR-

ANGO: 1 ♀, 2 ♂♂, 8 mi. S Canutillo, 9 Aug. 1951 (PDH, HEE) [CIS, MCZ]; 1 ♀, Tlahualilo, July 1905 (A. W. Merrill) [USNM]; 1 ♀, 2 ♂♂, San Juan del Rio, 7 Aug. 1951 (PDH, HEE) [CIS, MCZ]. ZACATECAS: 2 ♀♀, 3 ♂♂, 9 mi. N Ojo Caliente, 12 May 1962 (FDP) [UCD]. JALISCO: 1 ♀, 1 ♂, 8 mi. S Guadalajara, Sept. 1954 (FXW) [CAS]; 1 ♂, 17 mi. S Guadalajara, 25 May 1956 (HAS) [OSU]. GUANAJUATO: 1 ♂, 6 mi. N Silao, 24 Feb. 1953 (EIS) [CIS]. HIDALGO: 1 ♀, 1 ♂, Zimapan, 8 Oct. 1957 (HAS) [OSU]. MEXICO: 1 ♀, Teotihuacan, 24 March [Univ. Minn]. MORELOS: 4 ♀♀, Alpuyecá & vic., May, July (HEE, PDH) [MCZ, CU, USNM, CIS]; 3 ♀♀, 5 ♂♂, Cuernavaca & vic., Mch.-June 1959 (HEE) [CU, USNM, MCZ]; 1 ♂, Tepoztlan, 14 Apr. 1957 (CY) [MCZ]; 2 ♀♀, Canyon de Lobos, Mch., May 1959 (HEE) [CU]. OAXACA: 1 ♂, Oaxaca, 24 Aug. 1957 (HAS) [OSU]. YUCATAN: 1 ♂, Chichen Itza, June 1929 (JB) [MCZ]; 3 ♂♂, Progreso, 17-23 July 1962 (HEE) [MCZ]. COSTA RICA: 1 ♀, Alajuela, 2 Apr. 1938 (A. Alfaro) [MCZ].

Variation. — The females vary in length from 10 to 18 mm. Some females lack the black markings on the metanotum, postnotum, and propodeum and have the black of the mesosternum much reduced, while a few females have somewhat more extensive black markings than described for the type; the apical margins of the basal abdominal tergites are frequently weakly darkened, though never distinctly banded with black. The wings of the females vary from strongly to weakly suffused with yellowish; in nearly all specimens the weak band at the marginal cell is evident. The clypeus of the females varies from 1.9 to 2.1 X as wide as high; MID varies from .56 to .62 X TFD, UID from .85 to .95 X LID, antennal segment three from 1.0 to 1.2 X UID. In some specimens POL is subequal to OOL. There may be 3 or 4 comb-spines on the front basitarsus. In many specimens the mesosternal flaps are produced laterally to form slender processes, much as in *torridus*.

The males vary in length from 7 to 12.5 mm. The amount of variation in the black markings is comparable to that of the females; the wings vary from almost hyaline to wholly lightly infuscated, with a darker marginal band, and often have only a faint tinge of yellowish or none at all. MID varies from .59 to .65 X TFD, UID from 1.05 to 1.20 X LID; in some specimens POL barely exceeds OOL. Anten-



nal segment three varies from 1.4 to 2.0 X as long as wide. None of the variation in either sex seems closely correlated with geography. I have seen a very few specimens from southern California with wing color intermediate between that of *u. unicolor* and *u. cerinus*.

***Tachypompilus mendozae* (Dalla Torre) new combination**

Pompilus tuberculatus Smith, 1879, Desc. N. Sp. Hymen. Brit. Mus., p. 153 [Type: ♀, ARGENTINA: Mendoza (BMNH, no. 19, 739)]. Preoccupied by Smith, 1855.

Salix (*Priocnemis*) *tuberculatus* Kohl, 1884, Verh. K.K. Zool.-Bot. Ges. Wien, 34: 45.

Salix mendozae Dalla Torre, 1897, Cat. Hymen., 8: 232. New name.

Pompilus rutilans Fox, 1897, Proc. Acad. Nat. Sci. Phila., 258-259 [Type: ♀, BRAZIL: Chapada (CM)]. Synonymy by Banks, 1947.

Arachnophroctonus mendozae Banks, 1947, Bull. Mus. Comp. Zool., 99: 383 (Argentina).

The females of this species possess strong tubercles on the sides of the propodeum as well as yellowish, conspicuously banded wings, and hence are easily separated from other species of the genus. The species has not previously been recorded from Central America,

although it appears to be widely distributed in South America.

Female. — Length 13-18 mm. Body rufo-castaneous, marked with black as follows: extreme anterior part of mesoscutum (sometimes), postnotum and metapleura at least in part, extreme base and apex of propodeum medially, mesosternum and anterior margin of mesopleura, base of first abdominal segment, strong bands on apical margins of first two tergites, and usually some black at bases of middle and hind coxae. Wings strongly tinged with yellowish, apical margins lightly infuscated, fore wing also infuscated along basal and transverse median veins and again across middle of marginal cell, along second intercubital vein, and through apical half of third discoidal cell. Pubescence wholly pale; erect hair sparse, pale, propodeum weakly or not at all hairy. Clypeus 1.7-1.8 X as wide as its median length, shallowly emarginate apically. Malar space about half as long as second antennal segment. MID .56-.60 X TFD; UID .80-.86 X LID; antennal segment three 1.3-1.45 X UID; POL slightly exceeding OOL. Propodeum with a distinct, nearly flat declivity, on each side of the declivity with a small, acute tubercle. Front basitarsus with four comb-spines, the basal one sometimes small, the apical one subequal in length to the second tarsal segment. Mesosternal flaps transverse, sometimes produced on the sides.

Male. — Length 11-13 mm. Coloration as in female except some specimens with black in the ocellar triangle, over a considerable part of the anterior portion of the mesoscutum, sides of the metanotum, and a considerable part or (rarely) all of the pleura and coxae; dark band on T2 weaker than that on T1, sometimes obsolescent; wings as in female but slightly paler. Clypeus 1.5-1.7 X as wide as high, truncate below. Malar space present, nearly as long as second antennal segment. MID .58-.62 X TFD; UID and LID subequal; POL subequal to or slightly exceeding OOL. Vertex weakly arched above eye tops; temples narrow. Third antennal segment 2.1-2.3 X as long as wide. Propodeum with a strong, somewhat concave declivity; sides of propodeum, behind spiracles, with a rounded longitudinal welt which, in most specimens, is subangularly produced laterally. SGP shaped much as in *ferrugineus*, but tending to be somewhat setose along the median ridge.

Distribution. — Argentina, Brazil, Trinidad, and Panama; presumably widely distributed in South America. (Map 41.)

Central American specimens examined. — 1 ♀, 1 ♂. PANAMA: 1 ♀, Ancon, Canal Zone (W. M. Wheeler) [MCZ]; 1 ♂, Taboga Island, 19 Febr. 1912 (A. Busck) [USNM].

Variation. — The Panama female, like the one female from Trinidad in the MCZ collection, is rather small and has the upper part of the metapleura wholly black. The Panama male is also small and similarly colored. All three specimens have the wings less intensely yellowish than in the Argentinian females and males

before me, all of which also have less black on the metapleura. A male from Campinas, Brazil, has the coxae and pleura wholly black.

Genus **ANOPLIUS** Dufour¹⁸

Psammochares Latreille, 1796, *Precis Car. Gen. Insect.*, p. 115 [Type species: *Sphex fusca* Linnaeus, designated by Latreille, 1803]. Name suppressed by Internat. Comm. Zool. Nomen., Opinion 166, 1945.

Anoplius Dufour, 1834, *Ann. Soc. Ent. France*, 2: 483 [Type species: *Pompilus niger* Fabricius (= *nigerrimus* Scopoli), designated by Fox, 1901]. — Evans, 1951, *Trans. Amer. Ent. Soc.*, 76: 207-361 (revision of Nearctic spp.).

Generic characters. — Size 3 to 30 mm.; color predominantly black, some species with abdomen partially or wholly reddish, some males with the pronotum bordered with pale; apical tergite of female with at least a few stiff, backward-directed bristles, often densely bristly. Mandibles with one or two teeth on inner margin. Labrum without a median slit, not or but slightly protruding from beneath clypeus, the latter truncate or emarginate. Malar space very short. Antennae elongate, segment three in female at least 3 X as long as wide, in male at least twice as long as wide. Pronotum rather short, without a median impression. Postnotum a transverse band of variable width, never expanded on each side of the median line as in *Poecilopompilus* and related genera. Propodeum with smooth contours or with a well defined, flat posterior declivity. Front tarsus of female with or without a comb; apical tarsal segments spined beneath in female, usually also in male. Claws of female dentate except bifid in a very few species; claws of male entirely bifid, inner claws of front tarsus strongly curved and deeply cleft, apical segment of front tarsus in this sex either modified or not. Pulvillar comb strong, of from 8 to 24 subparallel rays. Fore wing with three SMCs (rarely only two); hind wing with anal vein arching up to meet median vein at or slightly before the cubital fork, occasionally slightly beyond; anal lobe at most half the length of the submedian cell (figs. 19, 20). Male venter with or without tufts of hairs; genitalia with the basal hooklets single or absent, aedoeagus simple and without spines or setae.

Distribution. — Cosmopolitan. The subgenera *Anoplius*, *Pompilinus*, and *Arachnophroctonus* occur widely throughout the globe, while *Lophopompilus* is Holarctic. *Notiochares* and *Anopliodes* are, to the best of my knowledge, restricted to the American tropics, while *Cameronoplius* is known from a single species occurring in Central Mexico. There are other subgenera in the tropics of the

¹⁸ For full synonymy, see also the various subgenera. For further references, see Evans, 1951.

Old World.

Key to Subgenera

Females

1. Front tarsus without a comb, the second segment with or without some minute spines on the outer side and with the usual apical ones 2
 Front tarsus with a comb of short to fairly long spines, the second segment with a spine on the outer side near the middle which is as long as that at the apex of this segment 3
2. Claws dentate except in *ithaca*, in this species the inner claws of each pair longer than the outer claws, in any case the inner ray acute; three SMCs present *Anoplius* Dufour
 Claws bifid, the inner ray truncate, inner and outer claws of each pair of the same size; only two SMCs present (fig. 20) *Cameronoplius* n. subgen.
3. Anterior margin of clypeus with a distinct median emargination; posterior margin of pronotum arcuate; head, thorax, and propodeum with abundant erect hairs *Lophopompilus* Radoskowski
 Anterior margin of clypeus not emarginate, or if so either the pronotum is angulate behind or the propodeum is weakly or not at all hairy 4
4. Transverse median vein of fore wing meeting the median vein beyond the origin of the basal; third SMC usually petiolate; spines of the tarsal comb short, at most twice as long as thickness of tarsus; wings never wholly deep fuliginous *Pompilinus* Ashmead
 Transverse median vein meeting media at or slightly before origin of basal, or if slightly beyond then otherwise not as above 4
5. Marginal cell long, removed from wing tip by not more than its own length, the radial vein rather evenly arched; SMC3 wider on radius than second; spines of tarsal comb very short *Anopliodes* Banks
 Marginal cell of variable length, radial vein always somewhat angled at third intercubital vein; SMC3 narrower on radius than second 5
6. Apical margin of clypeus with a median emargination (at least in the North and Central American species); front narrow, MID not over .56 X TFD *Notiochaes* Banks
 Apical margin of clypeus truncate, or if emarginate the front broader than above *Arachnophroctonus* Howard

Males

1. SGP with a large plumose process at its base which projects from the emargination of the preceding sternite *Lophopompilus* Radoszkowski
 SGP without a basal plumose process 2
2. S4 with a semicircular area of felt-like pubescence along its posterior mar-

- gin; SGP with a V-shaped emargination (figs. 75-77)
 *Notiochares* Banks
 S4 without such an area of felt-like pubescence; SGP not as above 3
 3. Last segment of front tarsus unmodified, the sides nearly parallel, not at all
 produced; SMC3 wide above, usually wider above than second
 *Anopliodes* Banks
 Last segment of front tarsus with the inner margin weakly to strongly lobed,
 the segment thus asymmetrical (one exception); SMC3 usually more
 strongly narrowed above than second, or there may be only two SMCs
 4
 4. Propodeum, in profile, sloping evenly from front to rear; venter often with
 dense brushes of hairs *Anoplius* Dufour
 Propodeum sloping weakly in front, then much more abruptly declivous on
 the posterior fourth; venter with brushes of hairs in a few species 5
 5. Only two SMCs present, the second large, receiving both recurrent veins;
 fore wing with the transverse median and basal veins interstitial (fig. 20)
 *Cameronoplius* n. subgen.
 With three SMCs in each fore wing (fig. 19) 6
 6. Transverse median vein of fore wing meeting media at or slightly before
 origin of basal vein (fig. 19) *Arachnophroctonus* Howard
 Transverse median vein of fore wing meeting media beyond origin of basal
 (as in fig. 21) *Pompilinus* Ashmead

Subgenus **LOPHOPOMPILUS** Radoszkowski

Lophopompilus Radoszkowski, 1887, Horae Ent. Soc. Ross., 21: 42 [Type species: *Pompilus grandis* Eversmann (= *samariensis* Pallas), designated by Ashmead, 1902]. — Regan, 1923, Ann. Ent. Soc. Amer., 16: 177-194 (generic status; revision of Nearctic spp.). — Evans, 1951, Trans. Amer. Ent. Soc., 76: 212-226 (subgenus; U. S. spp. revised).

Pompilogaster Howard, 1901, The Insect Book, pl. V, fig. 19 [Type species: *Pompilus aethiops* Cresson, monobasic].

Pompilogastra Ashmead, 1902, Canad. Ent., 34: 81 [Type species: *Pompilus aethiops* Cresson, monobasic].

Subgeneric characters. — Body with abundant erect hair, including front, pronotum, mesopleura, coxae, and propodeum. Clypeus of female with a distinct median emargination. Front rather broad. Posterior margin of pronotum arcuate. Female with a comb on the front tarsus; last segment of front tarsus of male unmodified. SMC3 of fore wing much narrowed above. SGP of male with a strong basal plumose process which projects from the emargination of the preceding sternite; SGP rounded apically, nearly flat. Male genitalia with the basal hooklets strong; digiti somewhat spindle-shaped, setose; parameres elongate, much exceeding the digiti.

Distribution. — Holarctic. Two of the Nearctic species occur in Mexico, one ranging into Guatemala. There are at least two endemic species of *Lophopompilus* in the West Indies, but the subgenus does not occur in South America.

Key to Species

- Female: front basitarsus with three rather short comb-spines; emargination of clypeus relatively broad. Male: upper front forming a nearly smooth surface with the eyes; OOL considerably exceeding POL; parameres slender, with a distinct preapical curvature *aethiops* (Cresson)
- Female: front basitarsus with four longer comb-spines; emargination of clypeus more narrow and sharply defined. Male: upper front rather flat, especially near eyes, which tend to bulge slightly from surface of head; OOL subequal to or slightly exceeding POL; parameres straight, rod-like *cleora* (Banks)

Anoplius (*Lophopompilus*) *aethiops* (Cresson)

Pompilus aethiops Cresson, 1865, Proc. Ent. Soc. Phila., 4: 451 [Lectotype: ♀, COLORADO (ANSP, no. 413)]. — Cresson, 1869, Proc. Boston Soc. Nat. Hist., 12: 367 (Orizaba, Mexico). — Cameron, 1893, Biol. Centr.-Amer., Hymen. II, p. 199.

Psammochares ilione Banks, 1910, Psyche, 17: 249 [Type: VIRGINIA: Falls Church, 12 Sept. (N. Banks) (MCZ, no. 13, 667)]. Synonymy by Regan, 1923.

Lophopompilus azotus Banks, 1929, Psyche, 36: [Type: ♀, SOUTH DAKOTA: Springfield, 14 Sept. (H. C. Severin) (MCZ, no. 16, 232)]. Synonymy by Evans, 1951.

Anoplius (*Lophopompilus*) *aethiops* Evans, 1951, Trans. Amer. Ent. Soc., 76: 215-218.

Female. — Length 13-23 mm. Black, pubescence reflecting deep bluish; wings fuscous, violaceous. Clypeus with a broad arcuate emargination. Front broad, MID .60-.64 X TFD; inner orbits convergent above, UID .80-.88 X LID; OOL distinctly greater than POL; third antennal segment somewhat shorter than UID. Front basitarsus with three comb-spines (rarely a small fourth, basal one), the apical one about half the length of the second tarsal segment.

Male. — Length 9-18 mm. Color of body and wings as in female. Apical margin of clypeus slightly arcuately concave. MID .62-.66 X TFD; UID about .90-.95 X LID; OOL distinctly exceeding POL. Upper front and vertex rather convex, forming a nearly smooth surface with the eyes. SGP with the basal plumose process relatively short, bearing some long setae. Genitalia with the parameres slender, slightly arched, with a distinct preapical curvature (see



fig. 72 in Evans, 1951).

Distribution. — This large and relatively common species ranges from Nova Scotia to British Columbia, south to North Carolina, Texas, and Guatemala. In Mexico the species occurs chiefly in open fields and meadows at high elevations, and is absent from the deserts and the coastal plains. (Map 42.)

Mexican and Central American specimens examined. — 39 ♀♀, 25 ♂♂. CHIHUAHUA: 1 ♂, San José Babicora, 5 July 1947 (Schramel) [AMNH]. DURANGO: 1 ♀, Las Puentes, 7500 feet, 24 July 1947 (MC) [AMNH]; 1 ♀, Navios Viejos, 2 Aug. 1951 (PDH) [CIS]; 1 ♀, 1 ♂, Palos Colorados, 8000 feet, 5 Aug. 1947 (Spieth) [AMNH]; 6 ♀♀, 1 ♂, Coyotes & vic., 8000 feet, Aug. [MCZ, CIS, AMNH]; 1 ♀, 6 mi. NE El Salto, 7900 feet, 23 July 1953 [KU]; 1 ♀, 45 mi. W Durango (RHP) [MCZ]; 1 ♂, 2 mi. NE Llano Grande, 27 Aug. 1956 (JWM) [CIS]. ZACATECAS: 9 ♀♀, 5 ♂♂, 15 km. E Sombrerete, 28-31 July 1951 (HEE, PDH) [MCZ, CIS]; 1 ♀, 1 mi. N San José de Felix, 14 July 1954 (EIS) [CIS]. JALISCO: 1 ♀, 2 mi. S Tlaquepaque, 11 July 1953 (P. Vaurie) [AMNH]. MEXICO: 1 ♀, 2 ♂♂, Teotihuacan Pyramids, June, July [MCZ,

ENAC]; 1 ♂, 1 mi. W Tepexpan, 7300 feet, 4 July 1959 (B. D. Valentine) [MCZ]; 1 ♀, Chapingo, 27 June 1961 (FPM) [ENAC]; 1 ♀, Valle de Bravo, 6500 feet, 3 Aug. 1962 (HEE) [MCZ]; 9 ♀♀, 9 ♂♂, 34 km. W Toluca, 8500 feet, 9 Aug. 1962 (HEE) [MCZ]. DISTRITO FEDERAL: 1 ♀, Los Reyes, 2 July 1952 (EG & CM) [CIS]. PUEBLA: 1 ♀, Puebla, 3 July 1952 (EG & CM) [CIS]. VERACRUZ: 1 ♀, Orizaba [U. Nebraska]. CHIAPAS: 1 ♀, 4 ♂♂, San Cristobal las Casas, 7500 feet, 26 April 1959 (HEE) [CU, MCZ]. GUATEMALA: 1 ♀ (no further data) [MCZ].

Anoplius (Lophopompilus) cleora (Banks)

Pompilus aethiops Fox, 1893, Proc. Calif. Acad. Sci., (2)4: 9 (Baja California). — Fox, 1894, *ibid.*, (2)4: 98. — Fox, 1895, *ibid.*, (2)5: 264. Misidentification.

Psammochares cleora Banks, 1917, Bull. Mus. Comp. Zool., 61: 108 [Type: ♀, CALIFORNIA: Los Angeles, 3 May 1915 (M. C. VanDuzee) (MCZ, no. 10, 020)].

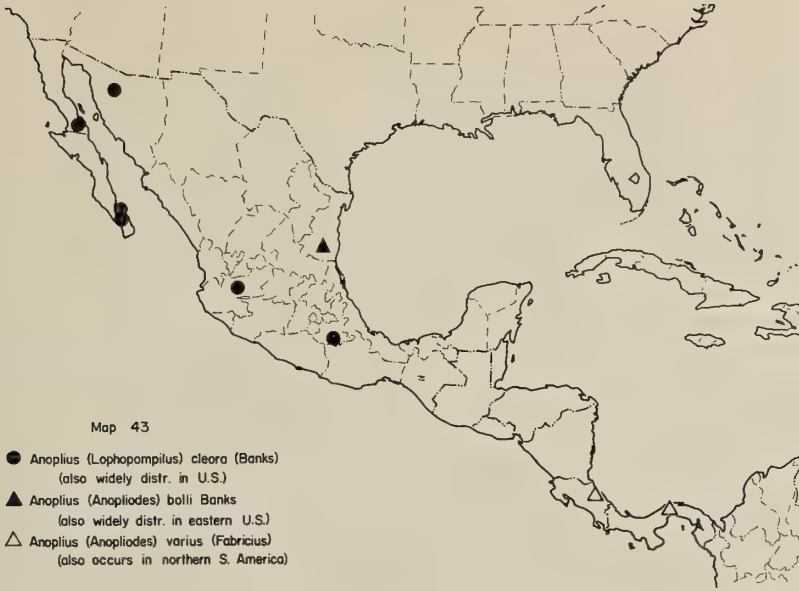
Anoplius (Lophopompilus) cleora Evans, 1951, Trans. Amer. Ent. Soc., 76: 218-220.

Female. — Length 13-19 mm. Black, pubescence obscurely reflecting deep bluish; wings fuscous, violaceous. Clypeus with a rather narrow and sharply defined median emargination. MID .58-.63 X TFD; inner orbits strongly convergent above, UID .72-.80 X LID; OOL subequal to or slightly greater than POL; third antennal segment subequal to or slightly shorter than UID. Front basitarsus with four strong comb-spines (rarely a small fifth, basal one), the apical one subequal to or slightly shorter than the second tarsal segment.

Male. — Length 9-16 mm. Color of body and wings as in female. Apical margin of clypeus slightly concave. MID .61-.64 X TFD; UID .85-.95 X LID; front rather flat, less full between the eyes than in *aethiops*; OOL subequal to or slightly exceeding POL. SGP similar to that of *aethiops*, but the basal plumose process somewhat longer. Genitalia with the parameres distinctly wider and straighter than in *aethiops*, with no preapical curvature; parameres strongly setose on ventral surface apically (see fig. 73 in Evans, 1951).

Distribution. — This species occurs transcontinentally in southern Canada and the United States except that it is largely absent in the southeastern states. In Mexico there are only a few records, but the species must be widely distributed in northern Mexico and at higher altitudes south to Jalisco and Puebla. (Map 43.)

Mexican specimens examined. — 5 ♀♀, 4 ♂♂. BAJA CALI-



FORNIA: 1 ♀, El Paraiso, May 1889 (C. Haines) [CAS]; 1 ♂, San Pedro, Dist. Sur, July 1919 (G. F. Ferris) [CIS]; 2 ♂♂, La Paz, June [CAS]. SONORA: 1 ♂, Pitiquito, 4 July 1952 (P. Vaurie) [AMNH]. JALISCO: 3 ♀♀, Guadalajara, 5000 feet, 12 July 1959 (HEE) [CU, MCZ]. PUEBLA: 1 ♀, 3 mi. NW Petlalcingo, 2 April 1962 (FDP) [UCD].

Subgenus NOTIOCHARES Banks

Notiochares Banks, 1917, Bull. Mus. Comp. Zool., 61: 107, 108 [Type species: *Pompilus philadelphicus* Lepeletier (= *lepidus atramentarius* Dahlbom), monobasic. — Banks, 1947, Bull. Mus. Comp. Zool., 99: 408-411 (South American spp., in part). — Evans, 1951, Trans. Amer. Ent. Soc., 76: 226-234 (U. S. spp.).

Subgeneric characters. — Similar in size and gross features to *Lophopompilus*, but body much less hairy than in that subgenus, the scape not hairy, pronotum, pleura, coxae, and propodeum only slightly to moderately hairy. Clypeus of female arcuately concave or distinctly emarginate apically. Front rather narrow in most species; antennae elongate, segment three in female usually as great as or greater than UID, segment three in male exceeding one or four. Posterior margin of pronotum angulate. Female with a tarsal comb;

last segment of front tarsus of male unmodified. SMC3 much narrowed above, often subtriangular; marginal cell removed from wing tip by about or somewhat less than its own length, the radial vein always somewhat angulate at the third intercubital vein. S4 of male with a semicircular mat of dense, short, black pile along its posterior margin. SGP at the base internally with a broad expansion on each side, at the apex of which is a small group of short, thick setae; apex of plate with a V-shaped emargination on each side of which it is more or less pointed (figs. 75-77). Parameres of the genitalia with a strong squama beyond which they are very slender; digiti covered with short setae; basal hooklets replaced by small, flap-like lobes; aedoeagus simple, somewhat expanded on the apical half.

Distribution. — Neotropical region, with two species extending into the southern parts of the Nearctic region.

Remarks. — In my 1951 treatment of this subgenus, I considered the North America elements to belong to a single polytypic species. However, two supposed subspecies both occur in southern Florida and do not intergrade, and study of the Mexican and Central American fauna reveals that two forms occur widely there and do not intergrade. I now feel that two polytypic species are unquestionably involved, one (*amethystinus*) being much more widely distributed and the only one occurring in the West Indies, northwestern Mexico and southwestern United States (west of Texas), and much of South America. The second species has a more limited range in northern South America, Central America, southern and eastern Mexico, and the eastern half of the United States. I am using the name *lepidus* Say for this species, although Say's type has long since been lost. I have selected a neotype which agrees perfectly with Say's description, as this seems to me a better solution than to consider Say's name a *nomen dubium*. The latter solution would necessitate the use of the name *coxalis* Banks, a name less directly applicable to the Mexican and Central American population, this species having been described from specimens from British Guiana, which is on the periphery of the range. This population might be considered subspecifically distinct by some people, thus requiring a new name for the Mexican and Central American population.

*Key to Species**Females*

1. Hind tibial spurs but little curved at their apices, the shorter spur straight or with a weak curvature; pubescence of entire body an intense blue or blue-green, occasionally somewhat silvery on the base of the mandibles and lower temples, but not on the front or elsewhere (*amethystinus*) .. 2
 Tibial spurs more or less curved apically, the shorter spur of the hind tibia with a quite distinct preapical curvature; pubescence dark violaceous or purplish to blue or blue-green of moderate intensity, when approaching intensity of *amethystinus* always with silvery or light cinereous pubescence on the front, sometimes also elsewhere (*lepidus*) 3
2. Clypeal emargination strongly defined, evenly concave; majority of specimens with the hairs of the propodeum sparse and short, generally shorter than maximum width of scape; range: Leeward Islands and Panama to southern Florida, Veracruz, and through western Mexico to Arizona and southern California *amethystinus amethystinus* (Fabricius)
 Most specimens with the clypeal emargination a little broader than above and with its base (i.e., on the midline) truncate or even weakly dentate; many specimens with the hairs of the propodeum more dense and in part about as long as the maximum width of the scape; range: Panama and Windward Islands south to northern Argentina
 *amethystinus exclusus* (Smith)
3. Pubescence extensively blue or blue-green, always silvery or light cinereous on the front and temples, sometimes more extensively so; range: Mexico to British Guiana *lepidus lepidus* (Say)
 Pubescence dark violaceous or purplish, with limited bluish reflections in certain lights; often with brownish pubescence on the front, coxae, and venter, but rarely silvery on the front or temples; range: eastern United States *lepidus atramentarius* (Dahlbom)

Males

1. SGP with a sharply defined, polished median carina, somewhat arched in profile and reaching nearly to the base of the apical emargination, the plate laterad of the median carina with some rather strong setigerous punctures (fig. 77); pubescence intensely blue or blue-green, sometimes silvery on the front and temples (*amethystinus*) 2
 SGP with the median carina low, not polished or sharply defined, usually barely evident toward the apex, the sides of the plate more weakly punctate than above (figs. 75, 76); pubescence variable (*lepidus*) 3
2. Apex of SGP with the lateral prongs sharp, the emargination between them strong and angular, the depth of the emargination at least half as long as the distance between tips of the apical prongs (fig. 77b); propodeum

- with a generally smaller number of hairs on the sides than below
 *amethystinus amethystinus* (Fabricius)
- Apex of SGP with the lateral prongs shorter and blunter in most specimens,
 the depth of the emargination generally about one third (.25-.40) as long
 as the distance between the tips of the apical prongs (fig. 77a); pro-
 podeum quite hairy on the sides of the posterior slope
 *amethystinus exclusus* (Smith)
3. Pubescence strongly bluish or blue-green, always silvery or light cinereous
 on the front and temples, sometimes more extensively so; apical prongs
 of SGP generally sharp and the emargination strong and angular, as de-
 scribed for *amethystinus amethystinus*, but specimens from northern
 South America often more like *exclusus* in this regard (fig. 76)
 *lepidus lepidus* (Say)
- Pubescence brownish-violaceous or somewhat purplish, reflecting bluish to
 a moderate degree in certain lights, not usually silvery on the front;
 emargination and apical prongs of SGP variable, rarely as sharply angu-
 lar as in Mexican specimens of *l. lepidus* (fig. 75)
 *lepidus atramentarius* (Dahlbom)

Anoplius (Notiochares) amethystinus amethystinus (Fabricius)

- Sphex amethystina* Fabricius, 1793, Ent. Syst. Emend. & Auct., II, p. 210
 [Type: ♀, VIRGIN ISLANDS: St. Croix (Dr. Pflug) (? no longer ex-
 tant)].
- Pompilus amethystinus* Fabricius, 1798, Suppl. Ent. Syst., p. 247. — Taschen-
 berg, 1869, Zeitschr. Ges. Naturw., 34: 50. — Dalla Torre, 1897,
 Cat. Hymen., v. 8, p. 272.
- Pepsis amethystina* Fabricius, 1804, Syst. Piezatorum, p. 215. — Cresson, 1867,
 Trans. Amer. Ent. Soc., 1: 149. — Dalla Torre, 1897, Cat. Hymen.,
 v. 8, p. 246.
- Pompilus anceps* Cresson, 1865, Proc. Ent. Soc. Phila., 4: 130 [Type: ♂, CUBA
 (ANSP, no. 420)]. Preoccupied by Smith, 1862; synonymy by Evans,
 1951.
- Pompilus cubensis* Cresson, 1867, Trans. Amer. Ent. Soc., 1: 93 (new name
 for *anceps*). Synonymy by Evans, 1951.
- Pompilus philadelphicus* var. *cubensis* Cresson, 1869, Proc. Boston Soc., Nat.
 Hist., 12: 366 (Orizaba, Mexico).
- Pompilus propinquus* Fox, 1891, Trans. Amer. Ent. Soc., 18: 339 [Type: ♀,
 JAMAICA: Kingston (USNM, no. 1858)]. Preoccupied by Smith,
 1879. New synonym.
- Pompilus philadelphicus* Cameron, 1893, Biol. Centr.-Amer., Hymen. II, p. 197
 (in part). — Fox, 1895, Proc. Calif. Acad. Sci., (2)5: 264 (Baja
 California, Nayarit).
- Pompilus dux* Dalla Torre, 1897, Cat. Hymen., 8: 286 (new name for *pro-
 pinquus* Fox, nec Smith). New synonym.
- Pompilus amethystinoides* Strand, 1911, Arch. Naturg., v. 77, bd. 1, suppl. 2,

p. 147 (proposed as new name for *amethystinus* Taschenberg, believed to differ from *amethystinus* Fabricius). New synonym.

Pompilus philadelphicus var. *floridensis* Banks, 1917, Bull. Mus. Comp. Zool., 61: 106 [Type: ♀, FLORIDA: Gulfport, Sept. (Reynolds) (MCZ, no. 10, 021)]. Synonymy by Evans, 1951.

Notiochaes fulgidus Banks, 1928, Harvard Biol. Lab. Cuba, Studies in Cuban Insects, I, p. 9 (not *fulgidus* Cresson; misidentification).

Notiochaes cubensis Bradley, 1946, Mem. Soc. Cubana Hist. Nat., 18: 130.

Anoplius (*Notiochaes*) *amethystinus amethystinus* Evans, 1951, Trans. Amer. Ent. Soc., 76: 229-231 (except South American records here reassigned to *amethystinus exclusus*, Central American records in part to *lepidus lepidus*).

Female. — Length 12-22 mm. Black; pubescence a brilliant, dark blue or blue-green over most of the body and legs, often somewhat brownish on the under side of the coxae, often cinereous or silvery on the base of the mandibles and lower temples, but the front with dark pubescence; wings fuliginous, with strong bluish reflections. Head and prothorax with moderately dense, dark setae; mesonotum and middle and hind coxae sparsely setose; mesopleura at most with inconspicuous short setae; propodeum with some short, rather inconspicuous hair on the sides, none of the hairs as long as the maximum width of the scape; abdomen strongly setose ventrally and densely bristly apically. Clypeus with a strongly defined, rather evenly concave median emargination. Front narrow, MID varying from .52 to .56 X TFD (mean .54); inner orbits subparallel below, convergent above, UID .75-.88 X LID. POL and OOL subequal. Antennae elongate, third segment equal to from 1.1 to 1.25 X UID. Front basitarsus with four comb-spines, the spines slightly longer than the width of the tarsus at their base (except the basal one often shorter than the others). Tibial spurs straight except shorter spur of middle tibia usually with a strong preapical curvature, shorter spur of hind tibia sometimes with a weak preapical curvature. SMC3 narrowed by half to two-thirds above.

Male. — Length 9-17 mm. Color of body and wings as in female, except the lower front usually silvery or at least light cinereous, as well as the temples and the base of the mandibles. Erect setae of head and thorax about as in female, the propodeum with a moderate amount of short hair on the sides; abdominal sternites (except the first) each with a number of strong setae in a transverse band; SGP with some strong setae toward the apex. Clypeus about twice as broad as high. MID .56-.61 X TFD; UID slightly less than LID; POL subequal to or slightly greater than OOL. Third antennal segment slightly longer than fourth, more than 3 X as long as wide. Middle and hind tibial spurs distinctly curved apically. SGP with a high, polished median carina which is somewhat arched in profile toward the apex, also with relatively strong but much shorter lateral carinae; plate with numerous strong setigerous punctures, especially on the apical half; apex with two sharp lateral angulations between which it is sharply, angularly emarginate, the depth of the emargination

generally at least half (.5-.7) X as great as the apical width measured from the tips of the lateral prongs (fig. 77b). Genitalia as described under the generic heading as figured by Evans, 1951, fig. 77 (the genitalia are much alike throughout this subgenus and of little value in species discrimination).

Distribution. — Panama to Mexico (Veracruz, Morelos) and up the west coast of Mexico to Arizona and southern California; also West Indies from Guadaloupe to Jamaica, Cuba, and the Bahamas, and throughout the southern third of the Florida peninsula. U. S. records were presented by Evans, 1951; I have since seen much additional material from Florida, Arizona, and California, but none of it extends the known distribution materially. Material from Panama and the Windward Islands southward is here included under *amethystinus exclusus* (Smith); intergradation of the two forms is discussed under that subspecies. (Map 44.)

Mexican and Central American specimens examined. — 61 ♀♀, 38 ♂♂. PANAMA: 2 ♀♀, Summit, Oct., Dec. (N. L. H. Krauss) [USNM]; 5 ♀♀, 3 ♂♂, Barro Colorado Island, Feb.-Sept. (CWR, P. Rau) [KU, MCZ, USNM]. COSTA RICA: 1 ♀, Palmar, May (D. O. Allen) [USNM]; 1 ♀, 1 ♂, Golfito, July-Aug. 1957 (Truxal & Menke) [Los Angeles Co. Mus.]; 1 ♀, San Carlos [USNM]; 1 ♂, San José (M. Valerio) [USNM]; 2 ♂♂, Columbiana Farm, Santa Clara Prov., Apr. 1924 (H. W. Atkinson) [USNM]. HONDURAS: 1 ♀, Puerto Castilla, Mch. (JB) [MCZ]; 1 ♀, Rio Paulaya, El Dorado, 16 Apr. 1923 (T. H. Hubbell) [U. Mich.]. GUATEMALA: 1 ♀, Bananera, 50 feet elev., Mch. (C. N. Ainslie) [USNM]; 1 ♀, El Salto, Escuintla, 28 June 1934 (JB) [MCZ]; 1 ♀, 1 ♂, Pt. Barrios, 3 Mch. 1905 (J. S. Hine) [Ohio State Univ.]. BRITISH HONDURAS: 1 ♂, Benque Viejo (Stanton) [USNM]; 1 ♂, Mt. Pine Ridge, Mch. 1931 (Bartlett) [USNM]. MEXICO: OAXACA: 3 ♀♀, 14 ♂♂, Palomares, 5 Sept. 1961 (RRD) [MSU]. VERACRUZ: 1 ♀, Jalapa, 6 July 1962 (RHP) [USNM]; 1 ♀, 4 mi. W Puerto Mexico, 18 April 1953 (EIS) [CIS]; 1 ♀, 1 mi. N Tecolutla, 12 June 1961 [KU]; 22 ♀♀, 6 ♂♂, Minatitlan, 26 Aug.-1 Sept. 1961 (RRD) [MSU]; 1 ♂, Orizaba, 8 Aug. 1961 (RRD) [MSU]; 3 ♀♀, Acayucan, 23 Oct. 1957 (RRD) [MSU]. MORELOS: 3 ♀♀, 3 ♂♂, Cuernavaca & vic., Jan.-Apr., Sept. (HEE, CY) [MCZ, CU]. MICHOACAN: 1 ♀, Zamora, 8 Sept. 1938 (L. Lipovsky) [KU]. JALISCO: 2 ♀♀, 2 ♂♂, Guadalajara, July (McClendon) [ANSP]. NAYARIT: 1 ♀, Tepic

[CAS]; 1 ♀, San Blas, 27 Aug. 1959 (LS & AM) [CIS]. SINALOA: 3 ♀♀, 3 ♂♂, Los Mochis, July, Aug. (C. T. Dodds) [USNM]. SONORA: 1 ♀, Hermosillo, 25 May 1955 (B. Malkin) [CIS]. BAJA CALIFORNIA: 1 ♀, Loreto, 20 May 1921 (E. P. VanDuzee) [CIS]; 2 ♀♀, San José del Cabo [CAS].

Remarks. — It seems curious that this species, which occurs widely in relatively humid areas, should extend up the west coast of Mexico into Arizona and southern California, for much of this area is quite arid. However, scarcely any variation worthy of note occurs throughout the extensive range of this form.

Anoplius (*Notiochares*) *amethystinus exclusus* (Smith) new combination

Pompilus exclusus Smith, 1873, Ann. Mag. Nat. Hist., (4)11: 444 [Type: ♂, BRAZIL: Pará (BMNH, no. 19, 700)]. — Dalla Torre, 1897, Cat. Hymen., v. 8, p. 288. — Fox, 1897, Proc. Acad. Nat. Sci. Phila., 49: 249.

Pompilus amethystinus Fox, 1897, Proc. Acad. Nat. Sci. Phila., 49: 242 (Brazil).

Pompilus pisoensis Strand, 1911, Arch. Naturg., v. 77, bd. 1, suppl. 2, pp. 147-150 [Type: ♂, ECUADOR: Piso (DeJoannis) (said to be in Paris Mus.; I have not seen it)]. New synonym.

Notiochares antillana Banks, 1944, Bull. Mus. Comp. Zool., 94: 184 [Type: ♂, BARBADOS: Aug. 1912 (Spencers) (MCZ, no. 25, 743)]. New synonym.

Notiochares amethystina Banks, 1944, Zoologica, 29: 111 (Br. Guiana). — Banks, 1947, Bull. Mus. Comp. Zool., 99: 410 (Colombia and Guianas to Paraguay and Bolivia).

As Banks (1947) has pointed out, South American males of *amethystinus* have the subgenital plate less sharply and deeply excised apically than in "*cubanus*"; but Banks failed to realize that specimens from the Virgin Islands (type locality of *amethystinus*) are like "*cubanus*". However, Smith's name *exclusus* is available for the South American form, which intergrades with typical *amethystinus* in Panama and extends up the Lesser Antilles to Barbados and St. Vincent. I consider *exclusus* at best a weak subspecies (see further discussion below, under "variation").

Female. — Length 14-22 mm.; coloration of body and wings exactly as in *a. amethystinus*; erect hairs about as in that subspecies except that some specimens have slightly longer hair on the mesopleura, and many specimens have

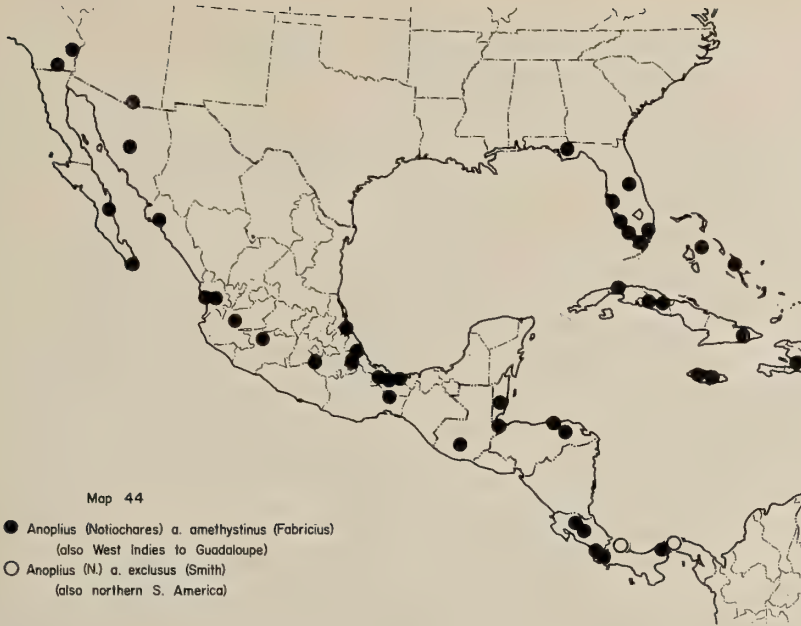
the hair on the propodeum slightly denser and longer, the longest hairs often about as long as the maximum width of the scape. Clypeal emargination nearly always a little broader and shallower than in *a. amethystinus*, its base (at the midline) generally rather straight or even projecting slightly as a very weak median tooth. Other characters as described for the nominate subspecies.

Male. — Length 9-17 mm. Coloration differing in no way from that of the nominate subspecies; erect hairs as in that form except many specimens with a slightly larger number of erect hairs on the propodeum, most specimens with the mesopleura and middle and hind coxae somewhat hairy. Features of head and thorax as described for *a. amethystinus*, the abdomen also as in that form (including the genitalia) except that the lateral apical prongs of the SGP are usually less sharply angulate, the median emargination less sharply angulate and less deep; the depth of the emargination varies from .25 to .40 X the apical width (measured between the tips of the lateral prongs), with occasional exceptions as noted below (fig. 77a).

Distribution. — Windward Islands (Barbados, St. Vincent) and Panama south to Bolivia and northern Argentina. The record from Argentina is based on a single female from "Delta de Buenos Aires", 7 April 1927 (M. Kisliuk) [USNM]. Fox (1897) and Banks (1944, 1947) provide numerous South American records for this apparently common form. (Map 44.)

Central American specimens examined. — 10 ♀♀, 7 ♂♂. PANAMA: 1 ♀, Ancon, May (J. Zetek) [USNM]; 8 ♀♀, 7 ♂♂, Barro Colorado Island, Feb.-Sept. (CWR, P. Rau) [KU, MCZ, USNM]; 1 ♀, Changuinola Dist., 28 Apr. 1924 (J. C. Bradley) [CU].

Variation. — It will be noted that 15 specimens from Barro Colorado Island are listed under *exclusus*, 8 under *a. amethystinus*. This is because these specimens key best to that subspecies in the key provided, but taken as a whole the series shows every possible gradation in the emargination of the clypeus of the female and of the subgenital plate of the male from typical specimens of each of the subspecies; perhaps more logically the whole series should be labeled as intergrades. The two specimens from Guayaquil, Ecuador, mentioned by Banks (1947) as possibly representing *pisoensis* Strand, have the subgenital plate typical of *a. amethystinus* (depth of the emargination .57 and .70 X apical width), possibly representing an introgression of genes from typical *amethystinus* down the west coast of South America to this point. Many specimens from northern South America have no more hair on the propodeum than in *a.*



amethystinus; in fact, some Brazilian and Guianan specimens have remarkably little hair on the propodeum. Nevertheless most specimens can be properly placed to subspecies by the nature of the clypeal or subgenital emargination.

***Anoplius (Notiochares) lepidus lepidus* (Say) new combination**

Pompilus lepidus Say, 1835, Boston Jour. Nat. Hist., 1: 304 [Type: ♂, "MEXICO" (no longer extant)]. — Cresson, 1867, Trans. Amer. Ent. Soc., 1: 94-95 (not identified). — Cresson, 1869, Proc. Boston Soc. Nat. Hist., 12: 367 (Orizaba, Mexico; Cresson apparently placed specimens of several species under this name). — Cameron, 1893, Biol. Cent.-Amer., Hymen. II, p. 199 (not identified).

Pompilus philadelphicus Cameron, 1893, Biol. Centr.-Amer., Hymen. II, p. 197 (in part).

Notiochares philadelphicus Banks, 1925, Bull. Mus. Comp. Zool., 67: 338 (Panama).

Anoplius lepidus Bradley, 1944, Notulae Nat., Acad. Nat. Sci. Phila., no. 145, p. 9 (not *lepidus* as interpreted here; Bradley examined some of Cresson's material and found it to belong to *Anoplius*, subgenus *Anoplius*). — Dreisbach, 1950, Amer. Midl. Nat., 43: 584 (not identified).

Notiochares coxalis Banks, 1945, Bol. Ent. Venez., 4: 100-101 [Type: ♀, BRITISH GUIANA: Kartabo, July-Aug. 1920 (W. M. Wheeler) (MCZ, no. 26, 700)]. — Banks, 1947, Bull. Mus. Comp. Zool., 99: 410. New synonym.

Anoplius (*Notiochares*) *amethystinus amethystinus* Evans, 1951, Trans. Amer. Ent. Soc., 76: 229-231 (in part; several Mexican and Central American records).

Say's name has been employed very loosely (or not at all) in the past. There are no specimens in the Harris collection at the MCZ which might represent type material of this species, and there seems no question that the type has been destroyed, like most of Say's. In order to pin down the name once and for all, I have selected the following neotype: ♂, MEXICO: MORELOS: 3 mi. NW Cuernavaca, 6500 feet, 7 June 1959 (HEE) [MCZ]. This specimen is 10 mm. long (i.e., two-fifths of an inch, as Say indicated), and agrees perfectly with Say's description so far as it goes. The males placed by Cresson in *lepidus* and mentioned by Bradley (1944) have strong hair-tufts on the abdomen (not mentioned by Say) and on the whole agree less well with the description. If one were to use the name *lepidus* in the subgenus *Anoplius* or discard it as a *nomen oblitum*, the name *coxalis* would have to be used for this form. However, *coxalis* was described from highly silvery-sericeous specimens from the extremity of the range, and future studies may indicate that this form should be regarded as a third subspecies. I might add that specimens in the MCZ determined by Banks as *lepidus* (although not published as such) agree with the present interpretation of this form.

The curvature of the tibial spurs is a less than ideal character for separating the females of *amethystinus* and *lepidus*. Actually only *lepidus lepidus* is broadly sympatric with *amethystinus*, and two additional characters are useful for its identification: the front of *l. lepidus* tends to be narrower (MID averaging .53 X TFD as compared to .54 in *amethystinus*), and the pubescence is a little finer and less intensely bluish, also always silvery or at least pale cinereous on the sides of the lower front (and sometimes elsewhere). By using the three characters in combination, one can usually separate the females, although the matter is still more difficult than separation of the males.

Female. — Length 11-21 mm. Black; pubescence rather strongly reflecting various shades of blue, blue-green, or violet over much of the body, including the femora, pubescence on the mesosternum and under side of the coxae brownish, that of the base of the mandibles, temples, and sides of the lower front light brownish or cinerous to silvery, some specimens also with silvery pubescence on the coxae, including the hind coxae above, and the posterior margin of the propodeum; wings fuliginous, with strong bluish reflections. Front and vertex with moderately dense, dark setae; temples and propleura densely setose; front coxae with some strong setae, but other coxae sparsely if at all setose; pronotum and propodeum with some short, fine hair, the thoracic dorsum and pleura scarcely hairy; abdomen setose ventrally and densely bristly apically. Clypeus with a strong median emargination. Front very narrow, scarcely wider than the two eyes taken together, MID varying from .51 to .55 X TFD (mean .53); inner orbits subparallel below or slightly diverging to the middle, then strongly convergent above; POL subequal to or slightly exceeding OOL. Third antennal segment equal to from 1.15 to 1.50 X UID. Front basitarsus with four comb-spines, the spines slightly longer than the width of the tarsus at their base (except the basal one often shorter than the others). Middle and hind tibial spurs tending to be more strongly curved apically than in *amethystinus*, shorter spur of hind tibia always evidently curved near the tip, usually quite strongly so. Third submarginal cell narrowed by .4-.8 above.

Male. — Length 9-14 mm. Coloration of body and wings as described for the female, the lower front and temples always with silvery pubescence. Erect setae about as in female, except coxae and thoracic dorsum tending to be slightly more setose, the propodeum also with somewhat longer and more abundant setae; abdomen sternites and the apical tergite each with some strong setae. Clypeus about twice as broad as high. MID .55-.60 X TFD; inner orbits strongly convergent on their upper third, UID distinctly less than LID; POL subequal to or slightly greater than OOL. Third antennal segment slightly longer than fourth. Spurs of middle and hind tibiae curved at their tips. SGP somewhat elevated medially, especially toward the base, but without a strongly defined, polished median carina as in *amethystinus*; basal half with a pair of lateral carinae of variable development; apical half with some strong setae, but the punctures from which they arise generally less strong than in *amethystinus*; apical emargination strong, angular, the lateral prongs rather sharp, depth of the emargination usually .6 or more X as great as the distance between the apical prongs (fig. 76) (but see below, under "variation"). Genitalia not differing noticeably from those of *amethystinus*.

Distribution. — British Guiana to Ecuador, north through Central America to Sinaloa and San Luis Potosi. I have seen no specimens from Tamaulipas, but I would expect specimens from that state to show evidence of intergradation with *atramentarius* (see also under

that subspecies). (Map 45.)

Mexican and Central American specimens examined. — 170 ♀♀, 151 ♂♂. PANAMA: 1 ♀, Boquete, Chiriquí [USNM]; 1 ♀, 1 ♂, Alhajuela, Mch. (A. Busck) [USNM]; 2 ♀♀, Pacora, Apr., May [USNM]; 2 ♀♀, 1 ♂, Cabima, May 1911 (A. Busck) [USNM]; 8 ♀♀, 10 ♂♂, Barro Colorado Isl., Mch.-Nov. [MCZ, USNM, KSU, KU]; 1 ♀, Frijoles, 10 July 1924 (NB) [MCZ]; 1 ♂, Rio Trinidad (A. Busck) [USNM]; 1 ♀, 1 ♂, nr. Rio Trinidad, Gatun Lake, 25 Mch. 1920 (J. C. Bradley) [CU]. COSTA RICA: 1 ♀, 1 ♂, San Carlos [USNM]; 12 ♀♀, 12 ♂♂, Pacuare, May-July 1949 (KWC) [USNM, MCZ]; 10 ♀♀, 13 ♂♂, Turrialba, July 1949 (KWC) [USNM, MCZ]; 6 ♀♀, Monteverde, Feb. 1963 (CWR) [KSU]; 3 ♂♂, Los Diamantes, 1948 (KWC) [USNM]; 1 ♂, Palmar (D. O. Allen) [USNM]; 1 ♀, 3 ♂♂, 12 mi. SW Cañas, Guanacaste Prov., 27 Feb. 1964 (HEE) [MCZ]. EL SALVADOR: 14 ♀♀, 4 ♂♂, 2.5 mi. W Quezaltepeque, July 1961 (M. Irwin) [UCD]. HONDURAS: 1 ♀, 2 ♂♂, Tela, May (T. H. Hubbell) [U. Mich.]; 1 ♂, Rio Paulaya, El Dorado, Apr. 1923 [U. Mich.]; 3 ♀♀, Corocito, 3 Apr. 1924 (JB) [MCZ]; 1 ♀, Roatan, Bay Is., 20 April 1935 (M. Bates) [MCZ]; 1 ♂, Aguan R. Valley, Apr. 1923 (T. H. Hubbell) [U. Mich.]; 1 ♀, Subirana, Yoro (Stadelmann) [MCZ]; 2 ♂♂, Sangre-laya, 13 Apr. 1924 (JB) [MCZ]. BRITISH HONDURAS: 1 ♀, 2 ♂♂, Augustine Mt. Pine Ridge, 3-7 July 1963 (CCP) [MCZ]; 2 ♂♂, Hummingbird Gap, Stann Cr. Dist., 8-11 July 1963 (CCP) [MCZ]. GUATEMALA: 1 ♀, Tikal, Petén, 15 May 1956 (T. H. Hubbell) [U. Mich.]; 1 ♀, 1 ♂, El Salto, Escuintla, June (FXW) [MCZ]. MEXICO: CHIAPAS: 1 ♀, 7.5 km. above Soyalo, 18 Apr. 1959 (T. C. Emmel) [Los Angeles Co. Mus]; 1 ♀, 7 ♂♂, Simojovel & vic., Mch. (EIS, RCB) [CIS]; 1 ♀, Ocozocoautla, 26 July 1952 (EG & CM) [CIS]; 1 ♂, Pueblo Nuevo, 20 Mch. 1953 (EIS) [CIS]; 1 ♀, 4 mi. NW Cocosingo, 8 Mch. 1953 (EIS) [CIS]; 1 ♀, 1 ♂, Ixtapa, 11 Apr. 1962 (FDP) [UCD]; 5 ♂♂, 28 mi. W Cintalapa, 9 Apr. 1962 (FDP) [UCD]. OAXACA: 3 ♀♀, 4 ♂♂, 7 mi. NE Juchitan, 18 July 1952 (EG & CM) [CIS, MCZ]; 1 ♂, 28 mi. N Matias Romero, 250 feet, 25 June 1961 [KU]; 1 ♀, 4 ♂♂, Palomares, 5 Sept. 1961 (RRD) [MSU]; 1 ♀, El Camaron, 21 July 1956 (JWM) [CIS]; 2 ♀♀, 22 mi. W Rio Coatzacoalcas, 14 Dec. 1955 (E. Bay) [CU];

1 ♀, 2 ♂♂, Tehuantepec, 18 July 1952 (EG & CM) [CIS]. YUCATAN: 1 ♀, 16 mi. N Merida, 17 July 1962 (HEE) [MCZ]. CAMPECHE: 1 ♀, 1 ♂, Candelaria, Dec. 1944 (M. Guerra) [AMNH]; 1 ♂, Escaranga, Dec. 1944 (M. Guerra) [AMNH]. VERACRUZ: 1 ♀, Cordoba (F. Knals) [USNM]; 1 ♂, 6 mi. N Jesus Carranza, 25 June 1961, 250 feet [KU]; 2 ♀♀, 1 ♂, Orizaba [MCZ, RRD]; 4 ♀♀, 5 mi. E Acultzingo, 5000 feet, 15 June 1959 (HEE) [CU, MCZ]; 3 ♀♀, 9 ♂♂, Fortin de las Flores, June, Sept. (FXW, HEE) [CAS, MCZ]; 1 ♂, 3 mi. S Santa Rosa, 17 Aug. 1959 (LS & AM) [UCD]; 1 ♂, 25 km. from Sureste, Aug. 1944 (M. Guerra) [AMNH]; 3 ♂♂, 7 mi. SE Catemaco, 28 April 1953 (RCB & EIS) [CIS, MCZ]; 2 ♀♀, 5 ♂♂, Minatitlan, 26 Aug. 1961 (RRD) [MSU]; 2 ♀♀, Rio Blanco, 13 Nov. 1957 (RRD) [MSU]; 2 ♀♀, Acayucan, 23 Oct. 1953 (RRD) [MSU]. SAN LUIS POTOSI: 1 ♀, El Salto, 1800 feet, 8 June 1961 [KU]; 1 ♀, 4 ♂♂, Xilitla, July 1954 [KU]; 1 ♀, Picolco, 21 May 1952 (MC) [AMNH]; 6 ♂♂, 15 mi. S Pujal, 21 June 1953 [KU, MCZ]. MEXICO: 1 ♀, 2 ♂♂, Valle de Bravo, 6500 feet, 3 Aug. 1962 (HEE) [MCZ]. MORELOS: 55 ♀♀, 24 ♂♂, Cuernavaca & vic., Mch.-June, Aug., Nov. [MCZ, CU, ENAC, CAS, RRD, USNM]; 1 ♀, 1 ♂, Yautepec & vic., Mch.-April 1959 (HEE) [MCZ]; 1 ♀, Tepoztlan, May 1956 (CY) [MCZ]; 1 ♀, Cuautla, Sept. [MCZ]; 1 ♀, Puente de Ixtla, 2000 feet, 31 July 1962 (HEE) [MCZ]; 1 ♂, Tetecala, 25 Mch. 1959 (HEE) [MCZ]; 1 ♂, Huajintlan, 2800 feet, 28 May 1959 (HEE) [MCZ]. COLIMA: 2 ♀♀, 2 ♂♂, Colima (L. Conrad) [USNM]. NAYARIT: 1 ♀, 17 mi. NW Tepic, 23 Nov. 1948 (ESR) [CAS]; 3 ♀♀, Ahuacatlan, 18 July 1951 (PDH) [CIS]. SINALOA: 1 ♀, Chupaderos, 600 feet, 21 Aug. 1962 (HEE) [MCZ].

South American specimens examined. — 4 ♀♀, 9 ♂♂. ECUADOR: 1 ♀, Guayaquil, 1930 (F. Campos R.) [USNM]. VENEZUELA: 1 ♂, Caripito, 14 Aug. 1937 (L. Martorell) [USNM]; 1 ♀, Caípe (P. Anduze) [MCZ]. BRITISH GUIANA: 2 ♀♀, 8 ♂♂, Kartabo, July-Aug. 1920 (W. M. Wheeler) [MCZ].

Variation. — Both sexes show a greater amount of silvery pubescence toward the south. The majority of specimens from Honduras to Panama, and all of those from South America, have silvery pubescence on the upper part of the hind coxae and in a transverse

band across the posterior edge of the propodeum (*coxalis* Banks). Panama males and those from Venezuela and British Guiana also have the emargination of the subgenital plate less deep and the lateral prongs less sharp, thus paralleling a trend in *amethystinus*, although the break is less distinct than between that form and its subspecies *exclusus*. Among these males from Panama eastward the depth of the emargination measures from .35 to .70 X the width between the apical prongs, this figure being very variable and showing much overlap with that for specimens from localities farther north and west.

Anoplius (*Notiochares*) *lepidus atramentarius* (Dahlbom) new combination

Pompilus atramentarius Dahlbom, 1844, Hymen. Europ., I, p. 48 [Type: ♂, "NORTH AMERICA" (Univ. of Lund, no. 54)].

Pompilus philadelphicus Lepeletier, 1845, Hist. Nat. Insectes, Hymen., III, p. 423 [Type: ♀, PENNSYLVANIA: Philadelphia (location of type not known to me)]. — Cresson, 1867, Trans. Amer. Ent. Soc., 1: 87. Synonymy by Evans, 1951.

Pompilus philadelphicus var. *sericatus* Cresson, 1872, Trans. Amer. Ent. Soc. 4: 202 [Type: ♂, TEXAS: Dallas (Boll) (ANSP, no. 411)].

Sericopompilus plutonis Banks, 1912, Jour. N. Y. Ent. Soc., 19: 228 [Type: ♂, TEXAS: Fedor, Lee Co., 3 June 1904 (Birkman) (MCZ, no. 13, 708)]. Synonymy by Evans, 1951.

Notiochares angusticeps Banks, 1939, Canad. Ent., 71: 227 [Type: ♀, TEXAS: Brownsville, 11-16 June 1933 (P. J. Darlington) (MCZ, no. 23, 477)]. Synonymy by Evans, 1951.

Anoplius (*Notiochares*) *amethystinus atramentarius* Evans, 1951, Trans. Amer. Ent. Soc., 76: 231-234.

A more complete list of references to this relatively common eastern U. S. form will be found in Evans, 1951. I have recently studied the type, which is in good condition and agrees with the present understanding of the subspecies. Evidence of intergradation with *lepidus lepidus* is discussed below, under "variation".

Female. — Length 15-24 mm. (averaging somewhat larger than *l. lepidus*). Black; pubescence violaceous, reflecting deep blue or blue-green in certain lights, somewhat brownish on the mesopleura, under side of the middle and hind coxae, and legs beyond the femora; pubescence of base of mandibles, temples, clypeus, and lower front varying from brownish to cinereous, occasionally somewhat silvery; wings fuscous, violaceous. Front narrow, but averaging slightly wider than in *l. lepidus*, MID varying from .52 to .55 X TFD; vertex tending to be slightly broader than in *l. lepidus*, third antennal segment



varying from 1.1 to 1.3 X UID. Other features as described for the nominate subspecies.

Male. — Length 12-19 mm., averaging larger than in *l. lepidus*. Color of body and wings as in the female; pubescence of sides of lower front varying from brownish-violaceous to golden-brown, rarely light cinereous or somewhat silvery. Features much as described for *l. lepidus* except with respect to the SGP; the plate tends to be slightly wider than in that form and with the sides more incurved toward the apex, the apical prongs rarely as sharp as in Mexican specimens of *l. lepidus* (though not differing notably from specimens from Panama and northern South America); depth of the apical emargination rather variable, .30-.60 X distance between apical prongs (fig. 75).

Distribution. — Eastern United States from Florida and western Texas to southern New England, Ohio, and Nebraska; also northern parts of Mexican central plateau, to Durango. For marginal U. S. records, see Evans, 1951. (Map 45.)

Mexican specimens examined. — 2 ♀♀, 1 ♂. COAHUILA: 1 ♀, Nueva Rosita, 23 July 1959 (R. Schrammel) [AMNH]. DURANGO: 1 ♀, 1 ♂, Nombre de Dios, 1-6 Aug. 1951 (HEE) [MCZ].

Variation. — In the Coahuila female and in the type of *angusticeps*, from Brownsville, Texas, the pubescence is more intensely blu-

ish than is usual in *atramentarius*, and in both specimens the front has pale, cinereous pubescence approaching the condition of *I. lepidus*; also, the Brownsville specimen has a very narrow front and vertex (MID .52 X TFD). I have seen no males which might be considered intergrades, as all Texas males before me as well as that from Durango have the pubescence dark and the emargination of the subgenital plate rather shallow.

Subgenus ANOPLIODES Banks

Anopliodes Banks, 1939, *Canad. Ent.*, 71: 225 [Type species: *Anopliodes modestus* Banks (= *bolli* Banks), monobasic]. — Evans, 1951, *Trans. Amer. Ent. Soc.*, 76: 234-240 (U. S. spp.).

Subgeneric characters. — Black, males always with a pale stripe along the posterior margin of the pronotum; males (and sometimes females) with extensive silvery pubescence and with much white hair on the propodeum. Front of female relatively narrow; clypeus not or but weakly emarginate. Posterior margin of pronotum weakly to strongly angulate. Tarsal comb of female consisting of short spines which are not or but little longer than the width of the tarsal segments. Last segment of front tarsus of males slender, unmodified. Upper part of first intercubital vein of fore wing oblique, so that SMC2 is much narrowed above, usually more so than the third; marginal cell long, removed from wing tip by about or less than its own length, radial vein with little if any evidence of an angulation at the third intercubital vein (except in some males). Wings of male showing a strong tendency to fold longitudinally. Male venter without the modifications of the preceding two subgenera, somewhat hirsute, sometimes with a dense brush of hair on S4; genitalia with the basal hooklets replaced by simple flaps.

Distribution. — This small complex of species is, so far as I know, confined to the warmer parts of the New World, the known species collectively ranging from Brazil and Peru to Kansas and New Jersey, including the West Indies. Only five species can currently be assigned here. Four of these occur in Mexico and Central America; the fifth, *vestoris* Banks, was described from Santa Catarina, Brazil.

Key to Species

Females

1. Propodeum with only a small amount of very short, scarcely noticeable hair, the propodeum relatively short and steeply declivous behind; upper part of first intercubital vein moderately oblique, SMC2 narrowed above

- by about half *bolli* Banks
- Propodeum with abundant, rather long hair, its declivity less steep than above; upper part of first intercubital vein strongly oblique, so that SMC2 is narrowed by two thirds or more above 2
2. Coxae wholly or mostly silvery-sericeous; propodeum silvery at least behind, and with long, whitish hairs; abdominal venter silvery and dorsum usually with at least some evidence of silvery bands; pronotum rather sharply angulate behind; clypeus usually more distinctly emarginate than below *varius* (Fabricius)
- Coxae without silvery pubescence except sometimes the posterior part of the hind pair; propodeum without silvery pubescence and with the hairs grayish or brownish; pronotum more broadly and indistinctly angulate behind than in *varius* or *bolli* *parsonsi* (Banks)

Males

1. Fourth sternite with a very dense brush of long setae, longer in front than behind, the other sternites sparsely setose 2
- Fourth sternite only slightly if at all more densely setose than other sternites 3
2. Flagellum wholly dark; pubescence extensively silvery, but abdominal venter and greater part of legs with brownish pubescence; genitalia with parameres unusually broad basally *bolli* Banks
- Basal flagellar segments more or less orange beneath; body richly ornamented with silvery pubescence, including virtually all the legs, pleura, and basal three sternites; parameres slender throughout *varius* (Fabricius)
3. Abdominal venter conspicuously setose, S4 somewhat more densely setose than the other sternites; genitalia with the digiti rounded apically, clothed with minute setae except for a lateral fringe of longer, curved setae (fig. 43) *parsonsi* (Banks)
- Abdominal venter with sparse, rather short setae, S4 no more setose than any other; digiti subtruncate apically, clothed with small setae over most of the disc, without a lateral fringe of longer setae (fig. 41) *chiriqui* n. sp.

Anoplius (*Anopliodes*) *bolli* Banks

Anoplius bolli Banks, 1917, Bull. Mus. Comp. Zool., 61: 104 [Type: ♂, TEXAS: Dallas (Boll) (MCZ, no. 10, 017)].

Anopliodes modestus Banks, 1939, Canad. Ent., 71: 226 [Type: ♀, TEXAS: Brownsville, 11-16 June 1933 (Darlington) (MCZ, no. 23, 476)].
Synonymy by Evans, 1951.

Anoplius (*Anopliodes*) *bolli* Evans, 1951, Trans. Amer. Ent. Soc., 76: 238.

Female. — Length 13-19 mm. Black; pubescence wholly dark; wings

moderately to heavily infuscated, fore wing often slightly darker along outer margin. Apical margin of clypeus slightly concave; front narrow, MID .50-.53 X TFD; UID .70-.80 X LID; POL and OOL subequal. Pronotum broadly but quite distinctly angulate behind. Propodeum short, its declivity well-defined, oblique, nearly flat; sides of propodeum with a few very short, inconspicuous setae. Front basitarsus with three comb-spines, occasionally a weak fourth one. SMC2 narrowed by .4-.6 above.

Male. — Length 10-13 mm. Black, pronotum narrowly margined with whitish or yellowish behind, scape sometimes with pale markings; wings subhyaline, apical margins distinctly, rather broadly, infuscated. Pubescence in considerable part dark, but silvery as follows: base of mandibles, clypeus, lower front, temples, coxae, pronotum in large part, posterior part of mesoscutum, sides of scutellum, metanotum, posterior part of propodeum, parts of the pleura, coxae, basal bands on T1-3, and apical spots or bands on T4-7. S2 and 3 with a few weak hairs; S4 with a dense brush of hairs, longer in front than behind; S5 and 6 somewhat hirsute. SGP strongly elevated medially, the apex rounded. Genitalia characterized by having the parameres very broad near the base, the broadened area clothed with short setae, beyond this with strong setae, some of which are clubbed; digitus rather slender, clothed with short, straight setae (see fig. 78 in Evans, 1951).

Distribution. — This species is not uncommon in eastern Texas, and ranges south into Tamaulipas and north and east to Kansas, New Jersey, and Florida. (Map 43.)

Mexican specimens examined. — 1 ♀. TAMAULIPAS: 1 ♀, 15 mi. W Xicohténcatl, 13 Aug. 1959 (LS & AM) [UCD].

Anoplius (Anopliodes) varius (Fabricius)

Pompilus varius Fabricius, 1804, Syst. Piezatorum, p. 189 [Type: ♂, "AMERICA MERIDIONALIS" (Copenhagen Mus)]. — Dalla Torre, 1897, Cat. Hymen., 8: 331. — Fox, 1897, Proc. Acad. Nat. Sci. Phila., 49: 256 (Brazil).

Anoplius varius Banks, 1944, Zoologica, 29: 112 (Br. Guiana). — Banks, 1947, Bull. Mus. Comp. Zool., 99: 420 (Surinam).

Psammochares caloderes Banks, 1945, Bol. Ent. Venez., 4: 102 [Type: ♀, COLOMBIA: Restrepo, Dept. Meta, 1936 (JB) (MCZ, no. 26, 229)]. — Banks, 1947, Bull. Mus. Comp. Zool., 99: 406. New synonym.

Psammochares alcatara Banks, 1945, Bol. Ent. Venez., 4: 103 [Type: ♀, BRITISH GUIANA: Kartabo, 27 March 1922 (MCZ, no. 26, 228)]. New synonym.

Psammochares alcataria Banks, 1947, Bull. Mus. Comp. Zool., 99: 404 (misspelling; Br. Guiana, Surinam, Colombia).

I have not seen the type of *varius*, but Fabricius' description seems

to fit this species quite well as far as it goes. I have little doubt that Banks' *caloderes* and *alcatara* represent the female of this species, the former being described from a specimen with unusually strong silvery banding. I am less certain as to how to separate the females from those of *parsonsi*, as the two species are very similar in this sex. The characters presented in the key are all relative, and if the males were not so distinct I would be inclined to consider them a single species.

Female. — Length 11-14 mm. Black, patterned with silvery pubescence as follows: clypeus, base of mandibles, lower front and temples, propleura, lower meso- and metapleura, all of coxae and sometimes much of remainder of legs, anterior part of pronotum, sides of metanotum, propodeum at least posteriorly and sometimes almost in its entirety, basal three sternites, basal bands on basal three tergites and much or all of apical two tergites. Wings strongly infuscated, hind wing and in some specimens the front wing tending to be more lightly infuscated on the posterior half. Clypeus with a shallow median emargination; front narrow, MID .48-.52 X TFD; UID .68-.75 X LID; antennal segment three 1.25-1.40 X UID; POL and OOL subequal. Pronotum broadly but distinctly angulate behind, about as in *bolli*. Propodeum sloping rather evenly, the declivity ill-defined and strongly oblique; surface covered with long, whitish hairs. Front basitarsus with three short comb-spines. SMC2 narrowed above by about two-thirds its width at the bottom; SMC3 wide above.

Male. — Length 9-12 mm. Black, except posterior margin of pronotum with a whitish or pale yellow stripe and basal segments of flagellum weakly to strongly suffused with orange below; wings hyaline, outer margins broadly infuscated, some specimens weakly infuscated along basal vein of fore wing. Pubescence in large part silvery, dark on the greater part of the mesonotum, disc of scutellum, anterior part of propodeum, apical parts of T1-3, all of T4, and sternites beyond basal three (in some specimens there are sparse silvery setulae on T4). S2 and 3 sparsely setose; S4 with a dense brush of hairs, longer in front than behind; S5 and 6 somewhat hirsute. SGP somewhat elevated medially, its apex narrowly rounded. Genitalia with the parameres slender except weakly broadened and long-setose basally; digiti strongly spatulate, rounded apically, covered with curved setae which are slightly longer toward the sides than mesally (fig. 42).

Distribution. — Peru and Surinam to Costa Rica. (Map 43.)

Specimens examined. — 6 ♀♀, 4 ♂♂. SURINAM: 1 ♀, Paramaribo, 9 May 1928 [CU]; 1 ♂, Barbara Pln., Surinam R., 11 Apr. 1927 [CU]. BRITISH GUIANA: 2 ♀♀, Kartabo, March, June [MCZ]. PERU: 1 ♂, Tingo Maria, Huanuco, 19 Sept. 1960 (J. M. Schunke) [BMNH]. ECUADOR: 1 ♀, Napo, Pano R., 8 April 1923 (FXW)

[MCZ]; 1 ♀, Tena, 20 April 1923 (FXW) [MCZ]. COLOMBIA: 1 ♀, Restrepo, Dept. Meta, 1936 (JB) [MCZ]. PANAMA: 1 ♂, Barro Colorado Island, Canal Zone, May 1929 (P. J. Darlington) [MCZ]. COSTA RICA: 1 ♂, Los Diamantes, 22 June 1949 (KWC) [USNM].

Anoplius (Anopliodes) parsonsi (Banks)

Psammochares parsonsi Banks, 1944, Bull. Mus. Comp. Zool., 94: 183-184 [Type: ♀, CUBA: Buenos Aires, Trinidad Mts., 17-23 June 1923 (C. T. Brues) (MCZ, no. 25, 742)].

Anoplius (Anopliodes) parsonsi Evans, 1951, Trans. Amer. Ent. Soc., 76: 236-238 (Florida).

This species occurs widely in Mexico and Central America, although not previously recorded from there. It is possible that the females here recorded from Panama actually belong to *varius* or to *chiriqui*, as I have seen no male *parsonsi* from south of Costa Rica, and the females of this complex are difficult to separate.

Female. — Length 10.5-15 mm. Black, pubescence largely dark, reflecting bluish in certain lights, often cinereous or silvery on the clypeus and lower front, in specimens from Costa Rica and Panama silvery on posterior part of hind coxae; abdomen wholly dark-pubescent, with no evidence whatever of banding. Wings strongly infuscated, with a somewhat darker outer marginal band. Apical margin of clypeus weakly concave; MID .48-.52 X TFD; UID .65-.72 X LID; antennal segment three equal to 1.25-1.45 X UID; POL equal to or slightly greater than OOL. Posterior margin of pronotum broadly, rather indistinctly angulate medially. Propodeum with the slope low, the declivity ill-defined, covered with long brownish or grayish hair. Wings and tarsal comb as described for *varius*.

Male. — Length 8-12 mm. Black, posterior margin of pronotum with a pale yellow stripe; wings hyaline, broadly and strongly infuscated apically. Body conspicuously patterned with silvery pubescence, as described for *varius*; T4 is extensively silvery in most Central American specimens, but there is enough variation in both *varius* and *parsonsi* to render this feature of little diagnostic value. S2-6 each with several long, dark setae, these setae distinctly more numerous on S4, but by no means forming a dense brush as in the preceding two species. SGP much like that of the preceding species, genitalia also very similar, but the digits clothed with minute setae except for a very strong lateral fringe of sinuous setae (see fig. 79 in Evans, 1951, also fig. 43 in present paper).

Distribution. — Panama to Mexico (Sinaloa, Puebla) and to Cuba and Florida. Since my 1951 treatment of this species I have



seen numerous specimens from northern Florida (Levy and Putnam Cos.) and one from Alabama (Tuscaloosa Co.); it seems possible that the species has been spreading northward within recent years. (Map 46.)

Mexican and Central American specimens examined. — 15 ♀♀, 17 ♂♂. PANAMA: 4 ♀♀, Barro Colorado Isl., Canal Zone, Mch., July-Aug. (CWR) [KU, KSU]; 1 ♀, Progreso, Chiriqui Prov., 25 Apr. 1923 (F. M. Gaige) [U. Mich.]. COSTA RICA: 1 ♀, 2 ♂♂, Turrialba, June-July 1949 (KWC) [USNM]; 2 ♀♀, 2 ♂♂, Pacuare, 1949 (KWC) [USNM]; 2 ♀♀, Monteverde, 1400 meters, Feb. (CWR) [KSU]. HONDURAS: 1 ♂, Prieta, 4 April 1924 (JB) [MCZ]; 1 ♀, San Francisco, 20 Aug. 1956 (B. D. Valentine) [MCZ]. EL SALVADOR: 3 ♂♂, Quezaltepeque, June-July 1963 (M. Irwin) [UCD]. GUATEMALA: 1 ♂, Cayuga, 15 June (W. Schaus) [USNM]. MEXICO: GUERRERO: 1 ♂, 3 mi. N Taxco, 5500 feet, 1 June 1959 (HEE) [MCZ]. VERACRUZ: 1 ♂, Acayucan, 23 Oct. 1957 (RRD) [MSU]; 1 ♀, 3 ♂♂, Orizaba, 12 Aug. 1961 (RRD) [MSU]. PUEBLA: 1 ♂, Cuetzalán, N of Zacapoaxtla, 3450 feet, 19 June 1961 [KU]. MORELOS: 1 ♀, Cuernavaca, 5500 feet, 5 June 1959

(HEE) [MCZ]; 1 ♂, Yautepec, 31 July 1963 (FDP, LS) [UCD]; 1 ♂, Tepoztlan, 18 Aug. 1956 (CY) [MCZ]. MEXICO: 1 ♀, Valle de Bravo, 6500 feet, 3 Aug. 1962 (HEE) [MCZ]. SINALOA: 1 ♀, 3 km. E Mazatlan, 15 Aug. 1954 (Ryckman, Spencer, Christianson) [MCZ].

Anoplius (*Anopliodes*) *chiriqui* new species

Holotype. — ♂, PANAMA: Boquete, Chiriqui Prov., 7 May (G. B. Fairchild) [MCZ, no. 30, 969].

This species is extremely similar to *parsonsi*, differing only in details of the male genitalia and secondary sexual characters. The female is unknown, but may possibly be the Panama females referred to *parsonsi* above.

Description of type male. — Length 10 mm.; fore wing 8.2 mm. Black, posterior margin of pronotum with a pale yellow stripe; wings hyaline, conspicuously infuscated along outer margin. Head and thorax extensively silvery-pubescent, dark only on upper part of head and parts of thoracic terga, basal half of propodeum, and metapleura; first three abdominal sternites silvery, first three tergites with basal silvery bands, tergites 5-7 with apical silvery spots. Head 1.15 X as wide as high; clypeus about twice as wide as high, its apical margin weakly concave. MID .61 X TFD; eyes convergent at the top, UID .92 X LID; OOL slightly exceeding POL. Third antennal segment 2.3 X as long as wide, slightly longer than fourth segment. Pronotum rather short, angulate behind. Propodeum with the slope very low, clothed with the usual white hairs. Longer spur of hind tibia three fourths the length of the basitarsus. SMC2 narrowed by two thirds above; SMC3 about as wide above as the second. Abdominal venter with sparse, short, relatively inconspicuous setae, these setae no longer or more abundant on S4 than elsewhere. SGP tectiform, rounded apically. Genitalia as shown in fig. 41, resembling closely those of *varius* and *parsonsi*, but the digits subtruncate apically, covered with short setae which are mostly straight, but some of them angulate apically.

Distribution. — Panama and Costa Rica. (Map 42.)

Paratypes. — COSTA RICA: 2 ♂♂, Golfito, Dept. Puntarenas, 1948 (P. & D. Allen) [MCZ, USNM].

Variation. — The two paratypes are similar to the type in size (fore wing 8.5 and 8.8 mm.) and in coloration of the body and pubescence. In both specimens the costal cell of the fore wing is infuscated, and there is a weak fuscous band over the basal vein. Head measurements are virtually the same as in the type except that

in one specimen POL and OOL are equal.

Subgenus **ARACHNOPHROCTONUS** Howard

Arachnophroctonus Howard, 1901, The Insect Book, pl. VII, figs. 11 and 14 [Type species: *Sphex tropica* Fabricius, *nec* Linnaeus (= *marginalis* Banks), designated by Pate, 1946]. — Evans, 1951, Trans. Amer. Ent. Soc., 76: 240-277 (U. S. spp.).

Arachnophila Ashmead, 1902, Canad. Ent., 34: 86 [Type species: *Pompilus divisus* Cresson (= *semirufus* Cresson), monobasic]. Preoccupied by Salvadori, 1874; synonymy by Evans, 1951.

Arachnodaictes Pate, 1946, Trans. Amer. Ent. Soc., 72: 74. New name for *Arachnophila* Ashmead.

Subgeneric characters. — Wholly black or with the abdomen marked with rufous, the pronotum occasionally with a whitish to orange band; propodeum with or without erect hairs. Clypeus with or without a median emargination. Female with a tarsal comb, the spines sometimes no longer than the width of the segments bearing them. Last segment of front tarsus of males with the inner margin weakly produced except in a few species. Marginal cell of fore wing about or somewhat more or less than its own length from the wing tip; three SMCs present; radial vein always somewhat angulate at the third intercubital vein; transverse median vein of fore wing usually interstitial with basal vein, occasionally slightly prefurcal (fig. 19). Male venter without unusual modifications in most species, somewhat hirsute and in a few species with dense brushes of hairs; genitalia with the basal hooklets distinct, single.

Distribution. — Throughout the tropics and warm temperate regions of the globe.

Included species. — This is a large group in tropical America, many of the South American species assigned by Banks (1947) to *Psammochaeres* properly belonging here. At least one of the South American species occurs in Panama and Costa Rica, and all eight of the species occurring in the United States also occur in Mexico. In addition, there are two Central American endemics. There are also several West Indian endemics, the best known of which is *insignis* (Cresson).

Remarks. — This subgenus occupies a central position in the genus. Certain species, notably *echinatus* and its relatives, seem somewhat annectant with *Anopliodes*, while those species centering around *americanus* seem to stand close to *Pompilinus*. Possibly this subgenus represents a generalized stock of *Anoplius* from which the other subgenera arose.

*Key to Species*¹⁹*Females*

1. Body entirely black or somewhat blue-black 2
 Abdomen rufous to orange-brown at least on the second tergite, often more extensively so 7
2. Marginal cell removed from wing tip by slightly to considerably less than its own length, the radial vein but slightly angled at the third intercubital vein; propodeal slope low and even, the declivity not well defined; front narrow, MID not much exceeding .50 X TFD *echinatus* (Fox)
 Marginal cell removed from wing tip by approximately or somewhat more than its own length, the radial vein more distinctly angulate at the third intercubital vein; propodeum with a fairly well defined oblique, rather flat declivity behind; front of variable breadth 3
3. Clypeus with a strong median emargination; pronotum arcuate behind; propodeum with only some short, inconspicuous hair; front broad, MID .56-.61 X TFD *acapulcoensis* (Cameron)
 Clypeus at most slightly concave apically; pronotum usually angulate or subangulate behind; other characters variable 4
4. Head very broad, measuring 1.2-1.27 X as broad as high; UID exceeding LID; third antennal segment only slightly more than half UID; propodeum with a short, steep declivity *xerophilus* Evans
 Head less broad, measuring less than 1.2 X as broad as high; UID less than LID (sometimes barely so); third antennal segment at least two-thirds X UID 5
5. Spines of tarsal comb distinctly longer than the width of the tarsus at their bases; hair of propodeum relatively long and dense; length 11-21 mm. *relativus* (Fox)
 Spines of tarsal comb not or barely longer than width of tarsus at their bases; propodeum not hairy or with some very short, fine hair; length 9-16 mm. 6
6. SMC3 narrowed by approximately two-thirds above; propodeum strongly convex and with an abrupt declivity on the posterior third; POL and OOL subequal *chiapanus* n. sp.
 SMC3 triangular or subtriangular, narrowed by at least .8 above; propodeum less convex and with the declivity less strongly defined; POL: OOL = 5:4 *moestus* (Banks)
7. Wings wholly deep fuliginous, violaceous; propodeum with some short, dark hair; front basitarsus with four (rarely three or five) strong comb-spines; size 11-20 mm. *marginalis* (Banks)
 Wings hyaline to moderately infuscated, with a darker marginal band; propodeum not or barely hairy, except when the entire body is un-

¹⁹ One species, *cuaudemoc* n. sp., is known from males only.

- usually hairy; front basitarsus with three comb-spines; average size smaller than above 8
8. Spines of tarsal comb little if any longer than width of tarsus at their bases; propodeum and T1 lightly if at all impressed; third antennal segment subequal to UID *americanus ambiguus* (Dahlbom)
- Spines of tarsal comb considerably longer than width of tarsus at their base; propodeum impressed medially, T1 with a median basal sulcus; third antennal segment equal to less than .9 X UID 9
9. Mesosternum with median apical processes which are short, angulate; MID .53-.58 X TFD; femora and basal parts of abdomen without long, black setae *apiculatus apiculatus* (Smith)
- Mesosternum with the median apical processes elongate, spiniform; front broader, MID .60-.67 X TFD; femora and basal parts of abdomen often with strong, dark setae *semirufus* (Cresson)

Males

1. Front and hind wings wholly and uniformly fuliginous, violaceous; propodeum with dark erect hair 2
- Front and hind wings hyaline or lightly infuscated, front wings sometimes moderately infuscated, always with a darker marginal band; propodeum with or without erect hairs 5
2. T2, and sometimes more of the abdomen, marked with orange; SGP broad and nearly flat, its margin fringed with curved hairs *marginalis* (Banks)
- Abdomen wholly black; SGP not as above 3
3. S4 and 5 with dense brushes of erect hairs; digiti of genitalia with a group of very long, clubbed setae on the disc *relativus* (Fox)
- Sternites with sparse setae, without dense brushes; digiti covered with shorter setae which are not clubbed 4
4. Marginal cell removed from wing tip by somewhat less than its own length; SGP without a series of suberect hairs along the midline; slope of propodeum very low, the declivity very short *echinatus* (Fox)
- Marginal cell removed from wing tip by about its own length; SGP with a series of suberect setae along the median ridge; slope of propodeum higher, the declivity stronger *acapulcoensis* (Cameron)
5. Head extremely broad, 1.2-1.3 X as wide as high; eyes strongly diverging above, UID about 1.2 X LID; propodeum with an abrupt, almost vertical declivity and with abundant dark hair *xerophilus* Evans
- Head not as broad nor the eyes diverging more than slightly above; propodeum with the declivity less abrupt, more sloping, bearing some pale setae or none at all 6
6. Body pubescence very fine, often in considerable part silvery; clypeus about twice as broad as high; venter with at least a few erect or suberect setae 7

- Body pubescence very coarse, extensively whitish or glaucous; clypeus at least 2.25 X as broad as high; propodeum and venter virtually without erect hairs 10
7. SMC3 narrowed by about two-thirds above; parameres unusually broad for this subgenus, digiti of characteristic shape (fig. 52) *chiapanus* n. sp. SMC3 triangular, often petiolate; parameres more slender 8
8. SGP wholly covered with erect, bristling setae of moderate length; posterior margin of pronotum very rarely with a whitish band *moestus* (Banks)
SGP with shorter, semierect or subappressed setae; posterior margin of pronotum with a whitish band 9
9. SGP with a distinct median elevation basally, tending to be less distinct apically, the sides of the plate broadly hyaline (fig. 82); digiti very large, directed strongly mesad and broadly overlapping apically, clothed uniformly with small setae (fig. 53) *cuaudemoc* n. sp. SGP barely elevated medially and not broadly hyaline on the sides; digiti erect, spindle-shaped, fringed with very long setae *americanus ambiguus* (Dahlbom)
10. Third antennal segment 1.8-2.3 X as long as wide, slightly shorter than fourth segment; SGP rounded apically *apiculatus apiculatus* (Smith)
Third antennal segment 2.4-3.0 X as long as wide, about as long as fourth segment; SGP acute or narrowly rounded apically, somewhat more roughly setose than above *semirufus* (Cresson)

Anoplius (*Arachnophroctonus*) *echinatus* (Fox) new combination

Pompilus echinatus Fox, 1897, Proc. Acad. Nat. Sci. Phila., 49: 242-243 [Type: ♀, BRAZIL: Rio de Janeiro, November (HHS) (CM)].

Psammochares echinatus Banks, 1944, Zoologica, 29: 111 (Br. Guiana). — Banks, 1947, Bull. Mus. Comp. Zool., 99: 405 (Br. Guiana, Brazil, Bolivia, Colombia).

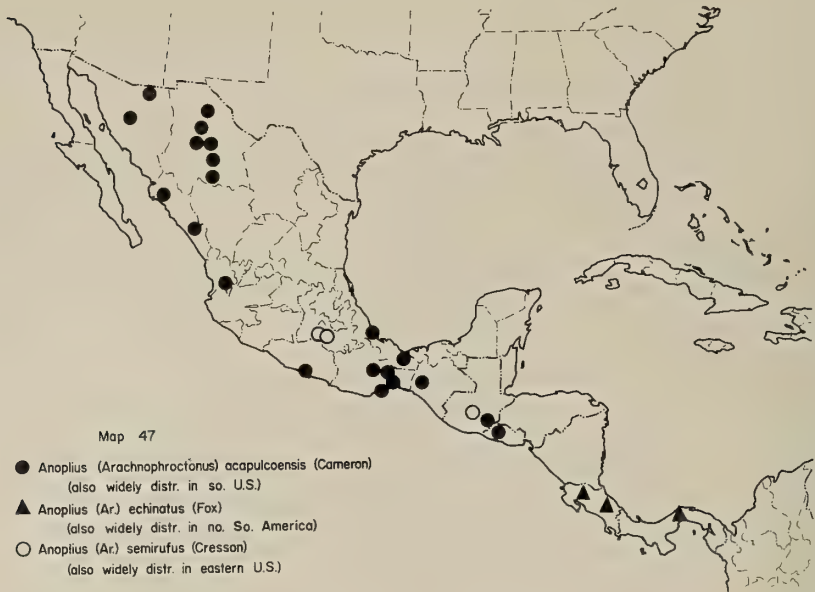
Notiochares diffinis Banks, 1947, Bull. Mus. Comp. Zool., 99: 410-411 [Type: ♀, PERU: Iquitos-San Rogue, March (Klug) (CU, no. 2501)]. New synonym.

As pointed out by Banks, this species is closely related to *vividus* Smith (= *ornamentus* Fox, new synonym), a species known only from males from Brazil and British Guiana and distinguished by its strongly banded wings. Banks suggested the two may be only varieties of one species, but there appear to be constant differences in the genitalia. Presumably the females of the two species cannot be distinguished, and since *echinatus* was described from a female, I cannot be sure that the name properly belongs with the form which enters Central America rather than falling as a synonym of *vividus*.

There is considerable variation in the depth of the emargination of the clypeus of the females before me, the type of Banks' *diffinis* representing only an extreme variant in this regard.

Female. — Length 12-18 mm. Black, wings wholly fuscous, violaceous; pubescence dark, reflecting dark bluish in certain lights, tending to be light brown or cinereous on the lower front and clypeus, coxae, venter, and apical tergites, the hind coxae often with a streak of silvery pubescence. Head with numerous dark setae, thoracic dorsum sparsely setose, propodeum with abundant fine, dark setae on the sides; pleura and middle and hind coxae without strong setae; abdomen strongly setose toward the apex, the apical tergite with abundant strong spines. Clypeus about 2.7 X as wide as its median length, apical margin broadly concave, the depth of the emargination somewhat variable, the clypeal margin nearly straight at the middle of the emargination. Front narrow, MID .48-.53 X TFD; UID .65-.75 X LID; third antennal segment 1.2-1.5 X UID. Front with a distinct median impression; POL and OOL subequal or either may be slightly the greater. Posterior margin of pronotum broadly angulate or subangulate. Propodeum with the slope low and even, the declivity barely defined. Front basitarsus with three comb-spines, the basal two 1.5-2 X as long as the width of the tarsus at their base. Fore wing with the marginal cell removed from the wing tip by slightly to considerably more than its own length; SMC2 and 3 both wide above; hind wing with anal vein reaching median vein at or slightly beyond origin of cubitus.

Male. — Length 9-14 mm. Black, posterior margin of pronotum with a pale stripe; wings wholly fuscous, violaceous in specimens from Colombia, Panama, and Costa Rica, specimens from British Guiana having the hind wings hyaline at the base and the fore wings obscurely banded. Body pubescence in part dark, reflecting bluish in certain lights, in part silvery; silvery pubescence occurs at least on the base of the mandibles, scape, front, temples, front of pronotum, propleura, coxae in part, lower mesopleura, posterior fifth of propodeum, base and sides of first tergite, and all of first three sternites; at the other extreme the thorax and propodeum may be wholly silvery except for parts of the dorsum, the legs wholly silvery, and the abdominal tergites conspicuously banded. Anterior margin of clypeus weakly concave. Front with a median linear impression, as in female; eyes strongly convergent at the top; ocelli as in female. Antennae very slender, third segment about 3 X as long as thick, very slightly exceeding the fourth. Posterior margin of pronotum broadly subangular. Slope of propodeum very low and even except with a very short, abrupt declivity at the extreme posterior end. Apical segment of front tarsus nearly symmetrical, the inner claws of this tarsus much more strongly bent than the outer claws. Wings as in female. Abdomen somewhat flattened above; venter with numerous short setae which show no tendency to form brushes. SGP elevated medially, with some fairly strong setae medially and apically, though not tending to form a series along the midline as in the following species; apical



margin rounded, with a series of short, thick spines. Genitalia (fig. 51) with the parameres slender, strongly setose, the sub-basal squama distinct although not strongly produced as in *vividus*; digiti subspatulate, densely clothed with strong, mostly straight setae.

Distribution. — Brazil and Bolivia north to the Guianas and to Costa Rica. See Banks, 1947, for South American records. (Map 47.)

Central American specimens examined. — 5 ♀♀, 7 ♂♂. PANAMA: 4 ♀♀, 4 ♂♂, Barro Colorado Isl., Canal Zone, March, April, June-Aug. (CWR) [KU, KSU]. COSTA RICA: 1 ♀, 1 ♂, Turrialba, May, Aug. (F. Schrader, CCP) [USNM, MCZ]; 1 ♂, Tilarán, Guanacaste Prov., 25 Feb. 1964 (HEE) [MCZ].

Variation. — The variation in size and in the depth of the clypeal emargination of the females seems to bear little correlation to geography. Males with the least amount of silvery pubescence, as described above, occur in Costa Rica, Panama, and Colombia, and all males seen from these areas have the wings uniformly fuliginous. One Panama male shows some banding of the tergites with silvery, differing little in this regard from some individuals from British Guiana, which tend toward the maximum in silvery pubescence.

Anoplius (*Arachnophroctonus*) *acapulcoensis* (Cameron) new combination

Pompilus acapulcoensis Cameron, 1893, Biol. Centr.-Amer., Hymen. II, p. 198 [Type: ♂, MEXICO: GUERRERO: Acapulco, Sept. (HHS) (BMNH, no. 19, 685)]. — Dalla Torre, 1897, Catal. Hymen., VIII, p. 270.

Psammochares bellicosus Banks, 1912, Jour. N. Y. Ent. Soc., 19: 224 [Type: ♂, ARIZONA: Palmerlee, Sept. (MCZ, no. 13, 666)]. New synonym.

Lophopompilus autilone Banks, 1919, Canad. Ent., 51: 82 [Type: ♂, FLORIDA: Fort Myers, 7 May 1916 (J. C. Bradley) (CU, no. 679)]. New synonym.

Anoplius (*Arachnophroctonus*) *bellicosus* Evans, 1951, Trans. Amer. Ent. Soc., 76: 246-248.

It is unfortunate that the well-established name *bellicosus* must be abandoned in favor of *acapulcoensis*, a somewhat awkward name based on a specimen from the southern extremity of the range. The type, like other specimens from southern Mexico, is more strongly bluish than most specimens from northern Mexico and the United States, paralleling a trend seen in several other species of Pompilinae (*Anoplius subcylindricus*, *Pompilus occidentalis*). The type and other specimens from southern Mexico also average small for the species, but there seems little justification for recognizing *acapulcoensis* and *bellicosus* as distinct subspecies.

Female. — Length 13-23 mm. Black; wings fuliginous, reflecting bluish. Pubescence entirely dark, reflecting deep bluish, violaceous, or blue-green. Front and vertex with a small amount of short hair; propodeum with only some very short, inconspicuous hair. Head broader than high, the vertex forming an even arc above the eye tops. Clypeus with a strong median arcuate emargination. Front broad, MID .56-.61 X TFD; front angle of ocellar triangle greater than a right angle, POL and OOL subequal; antennal segment three only .70 to .85 X UID. Posterior margin of pronotum arcuate, at most with a very vague median angulation. Propodeum sloping rather evenly, slightly more declivous on the posterior third. Front basitarsus with three comb-spines, the spines somewhat longer than the width of the tarsus at their base. Fore wing with the marginal cell removed from the wing tip by about its own length; SMC3 strongly narrowed above, often nearly triangular.

Description of type male. — Length 10.5 mm.; fore wing 9 mm. Black; wings fuliginous, reflecting bluish; pubescence reflecting bluish over much of body, except silvery on sides of front. Erect black setae numerous on clypeus, front, and vertex; pronotum and propodeum each with sparse, dark setae; venter with very sparse, dark setae except subgenital plate with a median row of sub-erect setae. Clypeus twice as broad as high, its apical margin weakly concave. Head 1.12 X as wide as high; MID .61 X TFD, .94 X HE; UID subequal to

LID; POL: OOL = 14:15. First four antennal segments in a ratio of about 12:6:11:12, segment three 1.9 X as long as thick. Pronotum arcuate behind; propodeum with the slope very gradual, then much steepened just before posterior margin. Last segment of front tarsus very slightly asymmetrical, inner claws of this tarsus more strongly curved than outer claws. Fore wing with SMC3 subtriangular. SGP strongly elevated and setose medially. Genitalia with the parameres slender, gently curved; digiti strongly bent about mid-way and somewhat broadened here, their entire surface covered with sinuous setae of moderate length (as figured by Evans, 1951, fig. 80).

Distribution. — El Salvador to Arizona and Texas, east to Florida and north to New Jersey. This species occurs chiefly at low elevations (usually below 4000 feet) and is therefore absent from a large portion of central Mexico. For U. S. records, see Evans, 1951. (Map 47.)

Mexican and Central American specimens examined. — 20 ♀ ♀, 32 ♂ ♂. MEXICO: CHIHUAHUA: 1 ♀, 92 km. N Chihuahua, June [AMNH]; 1 ♀, 2 ♂ ♂, Chihuahua, 12 Aug. 1951 (HEE) [MCZ]; 1 ♂, 17 mi. W Chihuahua, 5900 feet, 23 June 1956 (HAS) [OSU]; 1 ♀, 25 mi. S Chihuahua, 11 Aug. 1951 (PDH) [CIS]; 1 ♂, 18 mi. W Jimenez, 10 Aug. 1951 (HEE) [MCZ]; 1 ♂, Santa Clara Canyon, 5 mi. W Parrita, 6 July 1954 (EIS) [CIS]. SONORA: 1 ♀, Cornelio, 7 Oct. 1938 (R. H. Crandall) [CU]; 1 ♀, 10 mi. NE Cananea, 16 Aug. 1959 (Werner and Nutting) [UA]. SINALOA: 4 ♀ ♀, Los Mochis, July, Sept. (C. T. Dodds, RRD) [USNM, MSU]; 2 ♂ ♂, 8 mi. S Elota, 2 July 1963 (FDP) [UCD]. NAYARIT: 1 ♀, Ahuacatlan, 18 July 1951 (PDH) [CIS]. GUERRERO: 1 ♂, Acapulco, Sept. (HHS) [type, BMNH]. OAXACA: 2 ♀ ♀, 2 ♂ ♂, 4 mi. S Tehuantepec, 18 July 1952 (EG & CM) [CIS, MCZ]; 1 ♀, 7 mi. NE Juchitan, 18 July 1952 (EG & CM) [CIS]; 1 ♂, 16 mi. N Juchitan, 2 July 1955 [KU]; 3 ♂ ♂, El Camaron, 20 mi. E Oaxaca, 7 Aug. 1956 (JWM) [CIS]; 1 ♀, 2 ♂ ♂, 23 mi. S Matias Romero, 14 Aug. 1963 (FDP) [UCD]. CHIAPAS: 1 ♀, 3 ♂ ♂, 15 mi. W Las Cruces, 27 July 1952 (EG & CM) [CIS]. VERACRUZ: 1 ♀, Veracruz, 20 June 1951 (HEE) [MCZ]; 1 ♀, km. 25, RR from Sureste, Aug. 1944 (M. Guerra) [AMNH]; 2 ♀ ♀, 12 ♂ ♂, Minatitlan, 26 Aug.-1 Sept. 1961 (RRD) [MSU]. GUATEMALA: 1 ♀, Tiucal, 20 Aug. 1961 (M. Irwin) [UCD]. EL SALVADOR: 1 ♂, Quezaltepeque, 18 June 1963 (M. Irwin) [UCD].

Variation. — As noted above, specimens from Guatemala southern Mexico are consistently rather intensely bluish, while those from

northern Mexico and the United States show considerable variation in this regard, often having the pubescence brownish-violaceous, with limited bluish reflections. Southern specimens also average somewhat smaller. For example, the available males from southern Mexico (Guerrero, Oaxaca, and Chiapas) have a mean length of the fore wing of 10.8 mm. (ranging from 9.0 to 12.5 mm.), while the comparable figures for Chihuahua are 13 (12-15), Arizona 12.5 (9.5-15), Florida 13 (11.5-15). The genitalia of the type and other specimens from southern Mexico seem identical to those of U. S. specimens.

Anoplius (Arachnophroctonus) xerophilus Evans

Anoplius xerophilus Evans, 1947, Ent. News, 58: 10-14 [Type: ♂, NEW MEXICO: Steins, 14 July 1917 (J. C. Bradley) (CU, no. 2398)].

Anoplius (Arachnophroctonus) xerophilus Evans, 1951, Trans. Amer. Ent. Soc., 76: 253-255.

Arachnophroctonus gaigei Dreisbach, 1954, Amer. Midl. Nat., 52: 438-439 [Type: ♂, TEXAS: Phantom Lake, Davis Mts., 9 June 1916 (F. M. Gaige) (Univ. Michigan)]. Synonym by Evans, 1956, Ent. News, 67: 7.

This is a striking species by virtue of its very broad head. It has a limited distribution in arid regions of northern Mexico and southwestern United States.

Female. — Length 10-13 mm. Black; wings moderately infuscated, with a darker marginal band; pubescence very dark, reflecting bluish. Front with considerable short, dark hair; thoracic dorsum slightly hairy; propodeum with rather abundant dark hair of moderate length. Clypeus truncate apically. Head unusually broad, measuring 1.2-1.27 X as broad as high; inner orbits diverging above, MID 1.2-1.3 X LID, .61-.64 X TFD; UID about 1.1 X LID; third antennal segment only slightly more than half UID. Ocelli in a broad, flat triangle, the front angle much greater than a right angle. Pronotum rather long, feebly angulate behind. Propodeum with an abrupt, oblique, slightly concave declivity behind, the sides of the declivity faintly protuberant. Front basitarsus with three comb-spines, the spines only slightly longer than the width of the tarsus at their base. Fore wing with SMC3 four-sided although much narrowed above. T1 somewhat swollen, its anterior surface nearly perpendicular to the dorsal surface, this tergite with a faint median impression.

Male. — Length 7.5-12 mm. Black; wings lightly to moderately infuscated, with a darker outer marginal band; pubescence mostly dark, with bluish reflections, often silvery on the base of the mandibles, clypeus, and lower front, sometimes also on parts of the pronotum and propodeum. Propodeum with abundant, fairly long hair, but abdominal venter smooth, completely without



erect hairs. Head very broad, 1.2-1.3 X as broad as high; MID .63-.68 X TFD; UID about 1.2 X LID. Ocelli in a broad, flat triangle, OOL considerably exceeding POL; vertex slightly raised at the ocellar triangle. Pronotum as in female; propodeum sloping but weakly for most of its length, then almost vertically declivous behind. Last segment of front tarsus strongly lobed on inner margin, the inner claw of this tarsus much modified. SGP broad and smooth, the mid-line weakly carinate, the apex obtusely angulate. Genitalia with the parameres straight, the digiti clothed densely with setae which are bent near their apices (see fig. 81 in Evans, 1951).

Distribution. — Baja California, Durango, and Nuevo Leon to southern California, Utah, and western Texas. See Evans, 1951, for U. S. records; the Texas record is from Dreisbach, 1954. (Map 48.)

Mexican specimens examined. — 1 ♀, 5 ♂♂. BAJA CALIFORNIA: 1 ♂, 10 mi. S Punta Prieta, 21 June (AEM & ESR) [CAS]. CHIHUAHUA: 1 ♀, 18 mi. W Jimenez, 10 Aug. 1951 (HEE) [MCZ]. DURANGO: 2 ♂♂, 8 mi. S Canutillo, 9 Aug. 1951 (HEE) [MCZ]. COAHUILA: 1 ♂, 23 mi. N Saltillo, 11 Aug. 1959 (AM & LS) [UCD]. NUEVO LEON: 1 ♂, Vallecillo, 2 June 1951 (HEE) [MCZ].

Anoplius (Arachnophroctonus) marginalis (Banks)

Sphex tropica Fabricius, 1775, Syst. Ent., p. 350 (*nec* Linnaeus, 1758).

Pompilus tropicus Fabricius, 1798, Suppl. Ent. Syst., p. 250. — Cresson, 1867, Trans. Amer. Ent. Soc., 1: 98.

Arachnophroctonus tropicus Howard, 1901, The Insect Book, pl. VII, fig. 11.

Psammochares marginalis Banks, 1910, Jour. N. Y. Ent. Soc., 18: 118 [Type: ♀, NORTH CAROLINA: Southern Pines, 23 May (A. H. Manee) (MCZ, no. 13, 685)].

Psammochares castella Banks, 1910, Psyche, 17: 248 [Type: ♂, TEXAS: Fedor, Lee Co., 3 May 1909 (Birkman) (MCZ, no. 13, 689)]. Synonym by Evans, 1951.

Psammochares fabricii Banks, 1933, Psyche, 40: 6 (new name for *tropica* Fabricius, preoccupied). Synonym by Evans, 1951.

Anoplius (Arachnophroctonus) marginalis Evans, 1951, Trans. Amer. Ent. Soc., 76: 255-258.

A more complete list of references for this common North American species is given by Evans, 1951. The species has not previously been recorded from Mexico and in fact apparently occurs only in the extreme northern part.

Female. — Length 11-20 mm. Black, T2 with a broad band of orange, emarginate behind; rarely the orange extends to the adjacent tergites, even to the sternites. Wings fuliginous, somewhat violaceous. Pubescence wholly dark, somewhat brownish, obscurely reflecting bluish or greenish in certain lights. Propodeum with a rather variable amount of fine, dark hair. Clypeus very broad, 2.6-3.0 X as broad as high, subtruncate or somewhat rounded apically. Front broad, MID .57-.65 X TFD; UID .85-.95 X LID. Front angle of ocellar triangle greater than a right angle, OOL exceeding POL. Antennae relatively short, segment three measuring from .55 to .70 X UID. Pronotum broadly angulate behind. Propodeum short, with a well-defined flattened declivity. Front basitarsus with four comb-spines (rarely three or five), the spines 1.5-2 X as long as the width of the tarsus at their bases. Fore wing with SMC3 much narrowed above, subtriangular in most specimens.

Male. — Length 6.5-17 mm. Color of body and wings as in female; pubescence largely brownish, often silvery on sides of lower front. Propodeum with abundant dark hairs; abdominal venter with sparse, short setae. Front broad, MID .56-.64 X TFD; inner orbits diverging above, UID slightly exceeding LID. Ocelli in a broad triangle; OOL slightly greater than POL. Propodeal declivity much less abrupt than in the preceding species, front tarsus modified as in that species. SGP broad, rounded apically, nearly flat, its outer margin fringed with fairly long, curved setae. Genitalia with the parameres elongate, strongly setose; digiti slender and tapering, the disc clothed (except at the tip) with short setae, most of which are bent at an angle near their tips (see fig. 84 in Evans, 1951).

Distribution. — Arizona, Chihuahua, Texas, and Florida to Utah, Manitoba, Ontario, and Massachusetts. (Map 48.)

Mexican specimens examined. — 1 ♀, 3 ♂♂. CHIHUAHUA: 1 ♂, Villa Ahumada, 28 July 1953 (Kansas Univ. Exped.) [KU]; 1 ♀, 1 ♂, Samalayuca, 6 Aug. 1950 (RFS) [AMNH]; 1 ♂, Guzman, 4400 feet, 6 Aug. 1906 (P. P. Calvert) [ANSP].

Anoplius (Arachnophroctonus) relativus (Fox)

Pompilus relativus Fox, 1893, Canad. Ent., 25: 114 [Type: ♀, NEW JERSEY: Ocean Co. (ANSP, no. 412)].

Psammochares (Allocyphonyx) hesione Banks, 1910, Psyche, 17: 250 [Type: ♂, KANSAS: Douglas Co. (Snow) (MCZ, no. 13, 694)]. Synonym by Evans, 1951.

Psammochares difficilis Banks, 1917, Bull. Mus. Comp. Zool., 61: 105 [Type: ♀, VIRGINIA: Falls Church, 8 Sept. (NB) (MCZ, no. 10, 019)]. Synonym by Evans, 1951.

Anoplius confraternus Banks, 1926, Canad. Ent., 58: 201 [Type: ♀, ONTARIO: Ridgeway, 24 July 1910 (Van Duzee) (MCZ, no. 15, 802)]. Synonym by Evans, 1951.

Psammochares henshawi Banks, 1939, Canad. Ent., 71: 226 [Type: ♀, WASHINGTON: Ainsworth, 20 July 1882 (MCZ, no. 23, 480)]. Synonym by Evans, 1951.

Anoplius (Arachnophroctonus) relativus Evans, 1951, Trans. Amer. Ent. Soc., 76: 248-252.

Arachnophroctonus variegatus Dreisbach, 1957, Ent. News, 68: 72-74 [Type: ♂, NEW MEXICO (no further data) (AMNH)]. New synonym.

As the long list of synonyms suggests, this is a widely distributed and somewhat variable species. It is not uncommon over much of Mexico, but somehow escaped inclusion in the *Biologia Centrali-Americana*.

Female. — Length 11-21 mm. Black; wings fuliginous, violaceous; pubescence wholly dark, more or less bluish-refulgent. Front and vertex moderately hairy; thoracic dorsum sparsely hairy; propodeum with a considerable amount of erect hair, especially on the sides. Head about 1.10-1.15 X as wide as high; clypeus 2.6-3.0 X as wide as high, its apical margin truncate or slightly concave; vertex forming a gentle arc a short distance about tops of eyes. Front moderately broad, MID .54-.64 X TFD; UID .82-.95 X LID; antennal segment three equal to from .65 to .95 X UID. Ocelli in a broad triangle, front angle usually slightly greater than a right angle; POL and OOL nearly equal. Posterior margin of pronotum varying from arcuate to broadly angulate. Propodeum with a well-defined oblique declivity. Front basitarsus with three comb-

spines, the spines usually from 1.5-2.0 X as long as the thickness of the tarsus at their bases. Fore wing with SMC3 narrowed above by at least two-thirds its width at the bottom, often subtriangular (fig. 19).

Male. — Length 8-18 mm. Color of body and wings as in female, except pubescence on lower front and temples, sides of clypeus, and base of mandibles sometimes silvery. Front, vertex, and temples with abundant dark hair; propodeum with abundant, fairly long, dark hair; S4 and 5 with brushes of hairs, of somewhat variable length and density. Inner orbits divergent to just above the middle, then convergent above, UID subequal to or slightly greater than LID. Posterior margin of pronotum feebly angulate or almost arcuate. Propodeum sloping weakly in front, then abruptly, almost vertically declivous on the posterior fifth. Last segment of front tarsus strongly lobed on the inner margin. SMC3 commonly nearly triangular. Abdomen somewhat flattened dorsally, ventrally with hair-tufts as described above. SGP rather smooth, rounded apically, median portion slightly convex but not sharply elevated. Genitalia with the parameres slender, slightly curved; digiti somewhat spindle-shaped, directed strongly mesad apically and bearing a tuft of long setae which are curved upward apically (see fig. 2 in Evans, 1950).

Distribution. — Temperate and subtropical parts of North America, from Florida, Oaxaca, and Baja California to British Columbia, Ontario, and Massachusetts. Peripheral U. S. records were presented by Evans, 1951. In Mexico this species ranges throughout the central plateau and sparingly into the higher parts of Guerrero and Oaxaca, occurring chiefly in open country at altitudes of between 4000 and 7000 feet (except lower in northern Mexico). (Map 49.)

Mexican specimens examined. — 83 ♀♀, 89 ♂♂. NUEVO LEON: 1 ♀, Galeana, Aug. (R. Haag) [MCZ]. COAHUILA: 1 ♂, 28 mi. N Saltillo, Aug. (AM & LS) [UCD]. CHIHUAHUA: 3 ♀♀, 2 ♂♂, Samalayuca, June, Aug. [AMNH]; 1 ♀, Gallego, Aug. (WG) [AMNH]; 1 ♀, 1 mi. N San Isidro, Aug. (RFS) [AMNH]; 1 ♀, 2 mi. W Pedernales, 17 Aug. (RFS) [AMNH]; 2 ♀♀, Arroyo Mes-teno, Sierra del Nido, 7600 feet, July (W. C. Russell) [CIS]; 1 ♂, Santa Clara, July (CDM) [AMNH]; 1 ♀, 16 mi. SE Chihuahua, July (WG) [AMNH]; 1 ♂, 24 mi. SW Chihuahua, 6 Sept. 1962 (RHP) [MCZ]; 1 ♀, 70 mi. S Hidalgo del Parral, 6500 feet, 24 Oct. (HAS) [OSU]; 1 ♂, 5 mi. S Parral, 5 Sept. 1962 (RHP) [MCZ]; 1 ♂, 34 mi. S Chihuahua, 3600 feet, 25 Oct. (HAS) [OSU]; 1 ♀, 3 ♂♂, 18 mi. W Jimenez, 10 Aug. (HEE) [MCZ]; 1 ♀, 25 mi. S Chihuahua, Aug. (HEE) [MCZ]. SONORA: 1 ♀, 7 mi. S Hermosillo, 21 June 1957 (Chemsak & Rannells) [CIS]. BAJA CALI-

FORNIA: 4 ♀♀, 25 mi. W La Paz, 30 Aug. 1959 (Radford & Werner) [UA]; 1 ♀, 7 mi. N Santa Anita, 7 Jan. 1959 (HBL) [CAS]; 1 ♂, San Domingo, 19 July [CAS]. DURANGO: 14 ♀♀, 25 ♂♂, 8 mi. S Canutillo, Aug. (HEE, PDH) [MCZ, CU, CIS, USNM]; 3 ♂♂, San Juan del Rio, Aug. (HEE) [MCZ]; 1 ♀, 10 mi. W Durango, 12 July (EIS) [CIS]; 1 ♀, 16 mi. W Durango, 7000 feet, 22 Oct. (HAS) [OSU]; 2 ♀♀, Palos Colorados, 8000 feet, 5 Aug. (MC) [AMNH]; 1 ♀, Nombre de Dios, 6 Aug. (HEE) [MCZ]. ZACATECAS: 1 ♀, 16 mi. NW Fresnillo, 6600 feet (R. H. Brewer) [CAS]; 17 ♀♀, 3 ♂♂, 15 km. E Sombrerete, July (HEE, PDH) [MCZ, CU, CIS]. JALISCO: 4 ♀♀, 17 ♂♂, Guadalajara, July [MCZ, CU, ANSP]; 4 ♂♂, 7-8 mi. S Guadalajara, Aug., Sept. (FXW, RHP) [CAS, MCZ]; 1 ♂, 8 mi. SW San Juan Lagos, Aug. (JWM) [CIS]; 1 ♂, Puente Grande, 5000 feet, 20 Aug. 1954 [KU]; 1 ♀, 8 mi. NE Jalostitlan, 6000 feet, 19 July 1954 [KU]. MICHOACAN: 2 ♀♀, 60 mi. E Zamora, 24 June (Chemsak & Rannells) [CIS]; 1 ♀, 3 mi. E Carapan, 6500 feet, July (HEE) [MCZ]. PUEBLA: 1 ♂, 3 mi. N Petlalcingo, 3 Aug. 1963 (FDP) [UCD]. MEXICO: 1 ♀, Chapingo, June (FPM) [ENAC]; 4 ♀♀, 2 ♂♂, Teotihuacan, July [MCZ, ENAC, AMNH]. MORELOS: 8 ♀♀, 9 ♂♂, Cuernavaca & vic., 5500-6500 feet, June, Oct. [MCZ, CU, USNM]; 2 ♂♂, Tepoztlan, Aug. (C. M. Yoshimoto) [CU]; 1 ♀, 7.3 mi. SSW Yautepec, 2 July 1961, 3500 feet [KU]; 1 ♀, Xochicalco, 13 July 1961, 4000 feet (RRD) [MSU]; 2 ♂♂, Canyon de Lobos, nr. Yautepec, May, 4000 feet (HEE) [MCZ]; 3 ♀♀, 1 ♂, Alpuyeca & vic., 3000 feet, May, June (HEE) [MCZ]. GUERRERO: 1 ♀, 10 km. E Chilpancingo, 5200 feet, July (HEE) [MCZ]; 2 ♂♂, Chilpancingo, 24 July 1961 (RRD) [MSU]; 1 ♂, 3 mi. N Chilpancingo, Aug. (RHP) [MCZ]; 1 ♂, Zumpango, 22 July 1963 (FDP) [UCD]; 2 ♂♂, 3 mi. N Taxco, June (HEE) [CU, MCZ]. OAXACA: 1 ♀, 9 mi. SE Oaxaca, 21 Aug. 1959 (AM & LS) [UCD]; 1 ♂, Oaxaca, 5000 feet, 24 Aug. 1957 (HAS) [OSU].

Variation.—Mexican specimens of this species do not appear notably bluer and do not average smaller than U. S. specimens, as occurs in *acapulcoensis* and several other species. Most of the very considerable variation in this species appears to bear little correlation to geography. The single male from Oaxaca has the hair-brushes unusually short, and several males from Jalisco have the hair-brushes



long but unusually thin, one specimen having only a few hairs on the fourth sternite. There seem to be no important differences in the terminalia of these specimens and others of the species. Presumably these peripheral populations are somewhat isolated and show minor divergences from the norm.

Anoplius (Arachnophroctonus) chiapanus new species

Allotype. — ♀, MEXICO: CHIAPAS: El Zapotal, 2 mi. S Tuxtla Gutierrez, 9 July 1957 (PDH) [CAS].

Description of allotype female. — Length 10.5 mm.; fore wing 10 mm. Black; pubescence wholly dark, reflecting various shades of blue and blue-green, except posterior coxae silvery behind; fore wings moderately infuscated, with a darker band along the outer margin, hind wings lightly infuscated, subhyaline basally and posteriorly. Head with fairly abundant short setae; thoracic dorsum sparsely setose; propodeum with numerous short, fine hairs on the sides; front coxae setose but remaining coxae barely so; abdominal venter and apical tergites strongly setose, the apical tergite with an unusually large number of bristle-like setae. Head 1.15 X as wide as high, vertex passing straight across a very short distance above the eye tops. Clypeus 2.6 X as wide as high, its apical margin weakly concave. Front narrow, MID .53 X TFD; UID .86 X LID. Front angle of ocellar triangle about a right angle,

POL and OOL equal. Antennae moderately elongate, first four segments in a ratio of about 15:4:20:15, segment three equal to .9 X UID. Pronotum short, broadly angulate behind. Propodeum short, with a rather abrupt, nearly flat declivity on the posterior .4. Front basitarsus with three comb-spines, the spines only very slightly longer than the width of the tarsus at their bases. Anal vein of hind wing meeting median vein slightly beyond origin of cubitus. Fore wing with marginal cell removed from wing tip by about its own length; SMC3 slightly wider below than second but more strongly narrowed above, actually narrowed by about two-thirds above.

Holotype. — ♂, MEXICO: CHIAPAS: 12 mi. E Comitán, 3 Aug. 1952 (EG & CM) [CAS].

Description of type male. — Length 10 mm.; fore wing 8.5 mm. Black, upper outer orbits very narrowly pale, posterior margin of pronotum with a whitish stripe which is interrupted medially; fore wings lightly infuscated, with a dark marginal band; hind wings subhyaline, infuscated apically. Pubescence of much of thoracic dorsum and parts of abdomen dark, with bluish reflections, elsewhere strongly silvery, especially on the front, coxae, lower pleura, posterior part of propodeum, broad basal bands on basal three tergites, and all of remaining tergites, the pubescence being especially dense and pale on the apical tergite. Front with abundant dark setae; propodeum with many rather long, pale setae; abdominal sternites smooth except for a few inconspicuous setae on S5. Clypeus 2.2 X as wide as high, truncate below. Front broad, MID .63 X TFD; MID 1.2 X LID; UID subequal to LID. Ocelli in a right triangle; POL:OOL=5:6. First four antennal segments in a ratio of about 10:3:9:10, segment three twice as long as thick. Posterior margin of pronotum broadly angulate. Propodeum with a short, steep declivity behind. Last segment of front tarsus rather weakly lobed on inner margin; inner front tarsal claws strongly bent, the inner ray lobe-like, all other claws with the inner ray truncate and only slightly shorter than the outer ray. Longer spur of hind tibia nearly as long as basitarsus. Venation similar to that of female, except SMC3 not quite as wide as second, narrowed by about two-thirds above. Venter with only scattered short, inconspicuous setae. SGP broad, rounded apically, somewhat tectiform and hirsute medially. Genitalia with the parameres curved but slightly, broadest about one-third their length from the apex; digiti spindle-shaped, densely clothed with moderately long setae which are angled at their apices; base of digitus with a group of long setae (fig. 52).

Distribution. — Western Mexico to Costa Rica. (Map 48.)

Paratypes. — MEXICO: JALISCO: 2 ♀♀, Guadalajara, 5000 feet, 14 July 1959 (HEE) [MCZ, CU]. NAYARIT: 1 ♀, 35 mi. S Tepic, 27 July 1954 (MC, WG) [AMNH]. SINALOA: 1 ♀, Mazatlan, 19 July 1959 (HEE) [MCZ]; 2 ♂♂, 8 mi. S Elota, 2 July 1963 (FDP

& LS) [UCD, MCZ]. EL SALVADOR: 1 ♀, 5 ♂♂, Quezaltepeque, June, July 1963 (Cavagnaro & Irwin; Scullen & Bolinger) [UCD, OSU, MCZ]; 1 ♀, 2.5 mi. N Quezaltepeque, 6 July 1961 (M. Irwin) [UCD]. HONDURAS: 1 ♂, 7 mi. E Goascoran Valle, 200 feet, 25 July 1958 (Neff & Matthews) [MCZ]. COSTA RICA: 1 ♂, 8 mi. NW Liberia, 28 July 1963 (HAS) [OSU].

Variation. — The females vary in size from 9 to 13.5 mm., fore wing from 8 to 12.5 mm. In the larger females the vertex tends to form a weak arc a short distance above the eye tops. MID varies from .53 to .58 X TFD, antennal segment three from .73 to .90 X UID. Curiously, the claws are quite distinctly bifid in the type and in the female from Quezaltepeque, although in all other females (including the one from 2.5 mi. north of Quezaltepeque) they are dentate as usual in this subgenus.

The males vary in size from 7 to 10 mm., fore wing from 6 to 9.5 mm. The genitalia show but little variation, although the abundance and length of the erect setae on the SGP does show considerable variation, some specimens approaching *moestus* in this regard. In the male paratypes SMC3 is narrowed by .5-.7 above.

Anoplus (Arachnophroctonus) cuautemoc new species

Holotype. — ♂, MEXICO: GUERRERO: 3 mi. N Taxco, 1 June 1959, 5500 feet (HEE) [MCZ, no. 30, 971].

Description of type male. — Length 9 mm.; fore wing 7.5 mm. Black, upper outer orbits with a very small pale streak, posterior margin of pronotum with a strong whitish band; wings subhyaline, apical margin of fore wing and apex of hind wing with a broad fuscous band. Head, thorax, and basal parts of legs with fine, conspicuous silvery pubescence, absent only from vertex, mesoscutum, and scutellar disc, where the pubescence is dark; abdomen extensively silvery, especially on the apical tergites, pubescence darker at apices of basal tergites and also on much of sides and venter. Front and vertex with numerous erect setae; thoracic dorsum sparsely setose; propodeum with numerous pale setae on the sides; abdominal sternites each with a few dark setae of moderate length. Clypeus twice as broad as high, its apical margin truncate. Head 1.12 X as wide as high, the vertex forming a gentle arc between the eye tops; MID .61 X TFD; UID 1.06 X LID. POL and OOL subequal, front angle of ocellar triangle about a right angle. First four antennal segments in a ratio of about 20:5:14:15, segment three about twice as long as wide. Pronotum broadly, indistinctly angulate behind. Propodeum sloping but slightly

in front, roundly declivous on the posterior fifth. Last segment of front tarsus weakly lobed on inner margin, both the front tarsal claws strongly curved, the inner pair more than the outer; remaining claws with the inner ray truncate, not as long as outer ray. Longer spur of hind tibia nearly as long as basitarsus. Fore wing with marginal cell removed from wing tip by 1.2 X its own length; SMC3 not quite as wide as second, triangular; anal vein of hind wings interstitial with cubitus. SGP fairly broad, the apex weakly rounded, the median line strongly elevated basally, more weakly so toward the apex; sides of plate broadly unpigmented, translucent; surface clothed with short, semierect setulae (fig. 82). Genitalia with the parameres very slender, weakly curved; digiti rather large, spindle-shaped, directed strongly mesad so as to overlap apically, covered with erect setae except at tip; basal hooklets of characteristic shape (fig. 53).

Distribution. — Eastern Mexico to Costa Rica. (Map 50.)

Paratypes. — MEXICO: TAMAULIPAS: 1 ♂, Liera, 19 July 1954 (KU Mex. Exped.) [KU]. SAN LUIS POTOSI: 2 ♂♂, Xilitla, 23 July 1954, 1450 feet, 23 July 1954 (KU Mex. Exped.) [KU]; 1 ♂, 20 mi. N Tamazunchale, 19 May 1952 (MC) [AMNH]. VERACRUZ: 2 ♂♂, Fortin de las Flores, Aug., Sept. (RHP, FXW) [MCZ, CAS]; 2 ♂♂, Cordoba, 1 Jan. 1941 (GEB) [CIS]; 3 ♂♂, Orizaba, 12 Aug. 1961 (RRD) [MSU]; 1 ♂, Minatitlán, 26 Aug. 1961 (RRD) [MSU]; 1 ♂, Veracruz, 1-6 Aug. 1961 (RRD) [MSU]; 2 ♂♂, Acayucán, 23 Oct. 1957 (RRD) [MSU]. OAXACA: 4 ♂♂, Palomares, 5-21 Sept. 1961 (RRD) [MSU]. YUCATAN: 1 ♂, Chichen Itza, June 1929 (JB) [MCZ]; 1 ♂, 9 mi. E Chichen Itza, 13 Aug. 1963 (HAS) [OSU]. BRITISH HONDURAS: 2 ♂♂, Augustine Mt. Pine Ridge, 3-7 July 1963 (CCP) [MCZ]. EL SALVADOR: 1 ♂, Quezal-tepeque, 22 June 1963 (M. Irwin) [UCD]. COSTA RICA: 1 ♂, 6 mi. W Turrialba, 3800 feet, 21 July 1963 (HAS) [OSU].

Variation. — The 25 paratypes vary in size from 6 to 9 mm., the fore wing from 5.0 to 7.5 mm. In about half the specimens OOL exceeds POL slightly. SMC3 is non-petiolate, like the type, in most of the specimens, but it is short-petiolate in six (one from Fortin, one from Cordoba, one from Xilitla, one from Orizaba, and two from British Honduras) and rather long-petiolate in two (both Orizaba); in the Tamaulipas specimen SMC3 is narrowed by only .8 above. In some specimens SMC3 is as wide as SMC2, while in others it is not nearly as wide. The head is missing in one of the Cordoba and one of the Xilitla specimens.



This species is distinctly dimorphic (like the closely related species *americanus*, the males of which are tetramorphic). While most of the males are very similar to the type in coloration and in characters of the terminalia, three of them differ in the following particulars: second and third abdominal segments, and apical margin of first (in one case also base of fourth) orange-brown; digiti bearing very short, barely visible setae. I do not care to place these three specimens in a separate subspecies for several reasons: (1) the terminalia are virtually identical except that the setae on the digiti are much shorter in the rufous form, (2) the two forms have been taken together on one occasion but remain distinct, suggesting that they are either full species or morphs, (3) the dimorphism closely parallels that in *americanus* and involves some of the same characters. For the present I shall call the all-black form with longer setae on the digiti form BH, the rufous form with smoother digiti form RS; the latter is known only from two specimens from Yucatan and one from British Honduras (map 50).

Remarks. — The female of this species is doubtless very similar to that of *americanus*, and in fact is probably being confused with *americanus ambiguus* at the present.

Anoplius (Arachnophroctonus) moestus (Banks)

Pompiloides moestus Banks, 1912, Jour. N. Y. Ent. Soc., 19: 226 [Type: ♀, TEXAS, Fedor, Lee Co., April (Birkman) (MCZ, no. 13, 677)].

Anoplius comanche Banks, 1941, Canad. Ent., 73: 121 [Type: ♂, TEXAS: Nueces River, Uvalde Co., 2 July 1917 (JB) (MCZ, no. 25, 262)].
Synonymy by Evans, 1951.

Anoplius (Arachnophroctonus) moestus Evans, 1951, Trans. Amer. Ent. Soc., 86: 276-277.

Female. — Length 9-16 mm. Black; pubescence wholly dark, obscurely bluish, except sometimes cinereous or silvery on base of mandibles and lower front. Fore wings moderately to rather heavily infuscated, with a darker marginal band; hind wings subhyaline or lightly infuscated, darker apically. Propodeum with at most a small amount of very short, fine hair on the sides. Clypeus truncate or weakly concave below. Front narrow, MID .52-.56 X TFD; UID .8 to .9 X LID; third antennal segment subequal to UID; POL: OOL about as 5:4. Pronotum broadly angulate behind. Propodeum with a nearly flat, oblique declivity on the posterior third. Front basitarsus with three comb-spines, the spines not or barely longer than the width of the basitarsus; claws dentate. SMC3 triangular or subtriangular.

Male. — Length 5.5-11 mm. Black; wings subhyaline to moderately infuscated, with a darker marginal band. Pubescence silvery at least on the base of the mandibles, clypeus, front, and temples, often also on the propodeum and sometimes over much of the thorax; abdomen with the pubescence dark, obscurely bluish. Propodeum smooth or with a few weak, pale hairs on the sides. Front of moderate breadth, MID .56-.61 X TFD; UID subequal to or slightly greater than LID; POL subequal to or slightly greater than OOL. Pronotum angulate behind. Last segment of front tarsus only weakly produced on inner margin. SMC3 triangular, often petiolate. Venter with sparse setae, and S4-6 each with a patch of very short hairs near the base (not always clearly visible). SGP wholly covered with moderately long, fully erect setae. Genitalia with the parameres shorter than the digiti, the latter spindle-shaped, wholly covered with setae of moderate length which are angled upward at their tips (see fig. 86 in Evans, 1951).

Distribution. — This is a common species throughout much of Mexico except at low elevations (below 3000 feet) and in high altitude forests. The total range extends from Arizona and southern Kansas to Chiapas. (Map 51.)

Mexican specimens examined. — 78 ♀ ♀, 97 ♂ ♂. TAMAULIPAS: 1 ♂, 8 mi. S Jimenez, 15 June 1953 [KU]. NUEVO LEON: 3 ♀ ♀, 11 ♂ ♂, Vallecillo, 2 June 1951 (HEE, PDH) [MCZ, CIS]. COAHUILA: 1 ♀, Buena Vista, Sierra del Carmen, 22 July [CIS]; 2 ♂ ♂,



20 mi. S Piedras Negras, 10 Aug. 1959 (LS & AM) [UCD]. CHIHUAHUA: 1 ♀, Villa Allende, 6 Dec. [U. Minnesota]; 1 ♀, 2 ♂♂, 17 mi. W Chihuahua, 5900 feet, 20 June 1956 (HAS) [OSU]; 1 ♂, 66 mi. S Hidalgo del Parral, 6350 feet, 20 June 1956 (HAS) [OSU]; 1 ♀, 18 mi. W Jimenez, 10 Aug. 1951 (HEE) [MCZ]. DURANGO: 11 ♀♀, 9 ♂♂, 8 mi. S Canutillo, 9 Aug. 1951 (HEE, PDH) [MCZ, CU, CIS]. SINALOA: 1 ♀, 2 ♂♂, Potrerillos, 5200 feet, 21 Aug. 1962 (HEE) [MCZ]. ZACATECAS: 2 ♂♂, 15 km. E Sombrerete, 28-31 July 1951 (HEE) [MCZ]. NAYARIT: 3 ♂♂, 15 km. N Chapallilla, 19 July 1951 (HEE) [MCZ]. JALISCO: 1 ♀, 1 ♂, Guadalajara, 23 July 1951 (HEE) [MCZ]; 1 ♀, 1 ♂, 8 mi. S Guadalajara, Sept. (FXW) [CAS]; 3 ♀♀, 12 ♂♂, Villa Guadalupe, 26 July 1951 (HEE, PDH) [MCZ, CU, CIS]. MICHOACAN: 1 ♀, 33 mi. W Morelia, 7400 feet, 21 Sept. 1957 (HAS) [OSU]; 20 ♀♀, 3 ♂♂, 10 km. W Zitacuaro, 11 July 1951 (HEE, PDH) [MCZ, CU, CIS]. QUERETARO: 1 ♀, 11 mi. W Queretaro, 6000 feet, 18 Aug. 1954 (CDM) [KU]; 1 ♀, Palmillas, 7000 feet, 8 Aug. 1962 (HEE) [MCZ]. SAN LUIS POTOSI: 1 ♀, 5 mi. E Ciudad del Maiz, 23 Aug. 1954 (RRD) [MSU]. MEXICO: 1 ♂, Teotihuacan, 16 June 1951 (HEE) [MCZ]; 1 ♂, Valle de Bravo, 6500 feet, 3 Aug. 1962 (HEE)

[MCZ]. PUEBLA: 1 ♀, Tehuacan, 23 June 1951 (HEE) [MCZ]. VERACRUZ: 2 ♀♀, 2 ♂♂, 5 mi. E Acultzingo, 5000 feet, 9 June 1959 (HEE) [MCZ, CU]; 1 ♀, 1 ♂, Orizaba, 12 Aug. 1961 (RRD) [MSU]. MORELOS: 18 ♀♀, 30 ♂♂, 3 mi. NW Cuernavaca, 6500 feet, May-June 1959 (HEE) [CU, MCZ]; 1 ♀, 12 mi. E Cuernavaca, 4300 feet, 14 Aug. 1957 [KU]; 1 ♀, 8 ♂♂, Tepoztlan, Aug., Sept. (CY) [MCZ, CU]. GUERRERO: 1 ♀, Chilapa, 4600 feet, 29 July 1962 (HEE) [MCZ]; 2 ♂♂, Almolongo, 6000 feet, 29 July 1962 (HEE) [MCZ]; 1 ♂, 10 mi. E Chilpancingo, 5200 feet, 30 July 1962 (HEE) [MCZ]. OAXACA: 1 ♀, 3 mi. N Oaxaca, 8 July 1952 (EG & CM) [CIS]; 1 ♂, Oaxaca, 5000 feet, 24 Aug. 1957 (HAS) [OSU]. CHIAPAS: 1 ♀, 16 mi. NW Comitán, 3 Aug. 1952 (EG) [CIS].

Anoplius (Arachnophroctonus) americanus ambiguus (Dahlbom)

Pompilus ambiguus Dahlbom, 1845, Hymen. Europaea, Suppl. I, p. 452 [Type: ♀, MEXICO (Univ. Lund, no. 52)]. — Dalla Torre, 1897, Cat. Hymen., VIII, p. 272. — Evans, 1951, Trans. Amer. Ent. Soc., 77: 308 (listed as unrecognizable).

Pompilus coruscus Smith, 1855, Catal. Hymen. Brit. Mus., III, p. 156 [Type: ♀, SANTO DOMINGO (BMNH, no. 19, 644)]. — Cameron, 1893, Biol. Centr.-Amer., Hymen. II, p. 204 (Panama, Guatemala, Mexico). **New synonym.**

Pompilus juxtus Cresson, 1865, Proc. Ent. Soc. Phila., 4: 128 [Type: ♀, CUBA (ANSP, no. 421)]. **New synonym.**

Pompilus subargenteus Cresson, 1965, *ibid.*, p. 129 [Type: ♂, CUBA (Gundlach Coll., Havana) (not seen by present writer)]. — Cameron, 1893, Biol. Centr.-Amer., Hymen. II, p. 205 (Mexico). **New synonym.**

Pompilus coruscus var. *juxtus* Cresson, 1867, Trans. Amer. Ent. Soc., 1: 103. — Fox, 1894, Proc. Calif. Acad. Sci., (2)4: 99 (Baja Calif.).

Pompiloides subargenteus Banks, 1931, Bull. Brooklyn Ent. Soc., 26: 133 (Yucatan).

Anoplius puella Banks, 1941, Canad. Ent., 73: 121 [Type: ♂, TEXAS: Galveston, June (MCZ, no. 25, 261)]. **New synonym.**

Pompilinus orthodes Banks, 1944, Zoologica, 29: 112 [Type: ♀, BRITISH GUIANA: Georgetown, 29 Sept. 1922 (JB) (MCZ, no. 26, 642)]. — Banks, 1947, Bull. Mus. Comp. Zool., 99: 408 (Br. Guiana, Trinidad, Colombia). **New synonym.**

Anoplius varunus Banks, 1947, Bull. Mus. Comp. Zool., 99: 419 [Type: ♂, BRITISH GUIANA: New Amsterdam, Aug. 1923 (FXW) (MCZ, no. 27, 224)]. **New synonym.**

Anoplius (*Arachnophroctonus*) *americanus juxtus* Evans, 1951, Trans. Amer. Ent. Soc., 76: 273-275 (Panama to Calif. and Ala., also Cuba).

The type of Dahlbom's *ambiguus* is labeled "Mexico", although he gave only "America" in his original description. The type is in good condition and is a typical specimen of "*juxtus*" agreeing closely with specimens from Guadalajara and other central Mexican localities. The type of Smith's *coruscus* is also in good condition and has more rufous on the abdomen than the types of *juxtus* or *ambiguus*, as is typical of material from Hispaniola and the Lesser Antilles. Although I stated in 1951 that I considered *coruscus* to be distinct from *juxtus* and to belong in the subgenus *Pompilinus*, I was incorrect; the species I believed to be *coruscus* is described in a later page as *Anoplius* (*Pompilinus*) *hispaniolae* n. sp. Some aspects of variation in this highly variable form are discussed below.

Female. — Length 9-17 mm. Black, except abdomen bright orange-brown basally; T1 of this color except at extreme base, T2 entirely so, T3 entirely so or with a broad band which is emarginate behind, T4 and even T5 occasionally orange-brown in whole or greater part; basal sternites (especially the second) often in part or wholly orange-brown. Wings lightly to moderately infuscated, with a darker marginal band. Pubescence conspicuously silvery on the clypeus, lower front, and temples, sometimes also on parts of the pleura, coxae, and propodeum. Propodeum at most with some very short, pale, inconspicuous hairs on the sides. Clypeus truncate below. Front narrow, MID .50-.56 X TFD; UID .75-.85 X LID; POL:OOL about as 5:4; third antennal segment subequal to UID. Pronotum angulate behind. Propodeum with the median line lightly impressed in front, posterior third with a nearly flat declivity. Front basitarsus with three comb-spines, the spines not much if any longer than the width of the tarsal segments. SMC3 triangular or nearly so, sometimes short-petiolate.

Male. — Length 5-11 mm. Black, posterior margin of pronotum with a whitish stripe; basal portion of abdomen generally encircled with orange-brown, but in some specimens the abdomen is entirely black. Wings hyaline or subhyaline, outer margin of fore wing and tip of hind wing banded with brown. Silvery pubescence very extensive, the apical tergite especially densely pubescent. Propodeum often with a few pale, inconspicuous hairs on the sides; venter with sparse, short setae, or sometimes with denser and longer setae which tend to form loose brushes of hairs on sternites 3-5. MID varying from .54 to .64 X TFD; UID subequal to or slightly greater than LID; POL equal to or slightly exceeding OOL. Third antennal segment 2.0-2.2 X as long as wide, in most specimens very slightly shorter than fourth segment. Pronotum angulate behind; propodeum weakly impressed medially, steeply declivous on pos-

terior fifth. Last segment of front tarsus weakly produced on inner margin. SMC3 triangular, often petiolate. Venter with a variable amount of hair, as noted above; SGP with only sparse, suberect, rather short setae, its median line only weakly, roundly elevated, the apex rounded. Genitalia with the parameres slender, weakly curved; digiti spindle-shaped, acuminate apically, the center of the disc smooth, slightly concave, surrounded by extremely long setae, those toward the apex especially long, sinuate apically (see fig. 85 in Evans, 1951).

Distribution. — *Anoplius americanus* occurs throughout most of the warmer parts of North America, Central America, the north coast of South America, and the Greater and Lesser Antilles. Typical *americanus* is characteristic of eastern United States except Georgia and Florida, which are inhabited by a slightly larger and darker form, *trifasciatus*. Throughout the remainder of the range (north to California, Utah, Kansas, and Alabama) the species is rather variable, but there seems to be no basis for splitting it into further subspecies. For distribution of the three subspecies in the United States, see Evans, 1951. Antillean specimens of *ambiguus* before me are from Cuba, Hispaniola, Puerto Rico, St. Kitts, Barbados, St. Georges, and Grenada; South American specimens are from Trinidad, Surinam, British Guiana, and Colombia (for South American records see under *orthodes* and *varunus* in Banks, 1947). (Map 52.)

Mexican and Central American specimens examined. — 122 ♀♀, 178 ♂♂. MEXICO: TAMAULIPAS: (recorded by Evans, 1951). CHIHUAHUA: 1 ♀, Villa Ahumada, 28 July 1953, 3700 feet [KU]. SONORA: 1 ♂, 10 mi. E Navajoa, 13 Aug. 1959 (Werner & Nutting) [UA]; 6 ♂♂, Cocorit, 11 June 1961 (FDP) [UCD]. BAJA CALIFORNIA: 5 ♀♀, 3 ♂♂, San José del Cabo, Oct. [CAS]. SINALOA: 2 ♀♀, 3 ♂♂, Mazatlan, May, July, Aug. [MCZ, UCD, AMNH]; 3 ♂♂, Chupaderos, May, Aug. (HEE, FDP) [MCZ, UCD]; 2 ♂♂, Guamuchil, 6 May 1953 (RCB & EIS) [CIS]; 2 ♀♀, 1 ♂, 8 mi. SE Elota, 19 May 1962 (FDP) [UCD]; 1 ♂, 11 mi. N Culiacan, 20 May 1962 (LS) [UCD]. DURANGO: 1 ♀, Ventanas, 2000 feet (Forrer) [BMNH]; 1 ♀, 7 ♂♂, Nombre de Dios, 6 Aug. 1951 (HEE) [MCZ]. NAYARIT: 4 ♂♂, San Blas, 20 July 1951 (HEE, PDH) [MCZ, CIS]; 2 ♂♂, 5 mi. E San Blas, 25 July 1957 [KU]. JALISCO: 7 ♀♀, 2 ♂♂, Guadalajara, 12-24 July (HEE, PDH) [MCZ, CIS]; 2 ♀♀, 8 mi. S Guadalajara, Sept. 1954 (FXW) [CAS]. GUERRERO: 1 ♀,

Rincon, 2800 feet, Oct. (HHS) [BMNH]; 1 ♀, Tierra Colorado, 2000 feet, Oct. (HHS) [BMNH]; 1 ♂, Acapulco, 1 July 1951 (HEE) [MCZ]. MORELOS: 1 ♀, 1 ♂, Tetecala, 25 Mch. 1959 (HEE) [MCZ]; 1 ♀, 3 ♂♂, Lake Tequesquitengo, 1 April 1959 (HEE) [MCZ]; 3 ♂♂, Puente de Ixtla, 2000 feet, 31 July 1962 (HEE) [MCZ]; 1 ♂, Progreso, 28 May 1961 (FPM) [ENAC]; 16 ♂♂, Las Estacas, 3000 feet, 6 April 1959 (HEE) [MCZ]; 6 ♀♀, 25 ♂♂, Alpuyeca & vic., Mch.-July (HEE, PDH) [MCZ, CIS, CU]; 7 ♀♀, 22 ♂♂, Cuernavaca & vic., 4500-5500 feet, Apr.-June 1959 (HEE) [MCZ, CU]. PUEBLA: 1 ♀, 3 mi. NW Petlalcingo, 3 Apr. 1962 (FDP) [UCD]. VERACRUZ: 47 ♀♀, 29 ♂♂, Minatitlan, 26 Aug.-1 Sept. 1961 (RRD) [MSU]; 3 ♀♀, Acayucan, 23 Oct. 1957 (RRD) [MSU]; 1 ♀, San Andres Tuxtla, 25 Oct. 1957 (RRD) [MSU]; 2 ♀♀, Veracruz, 1 Nov. 1957 (RRD) [MSU]; 1 ♂, Coscomatepec, 27 Apr. 1962 (LS) [UCD]; 3 ♂♂, Atoyac, April (HHS) [BMNH]; 1 ♀, La Gloria Cardel, Jan. 1938 (J. Camelo) [USNM]; 2 ♀♀, Fortin de las Flores, Sept. 1954 (FXW) [CAS]; 1 ♂, Boca del Rio, 23 June 1961 [KU]; 1 ♂, Tinajas, 18 Aug. 1963 (FDP) [UCD]. TABASCO: 1 ♂, 7 km. SW Frontera, 10 Aug. 1962 (RFS) [CIS]. OAXACA: 1 ♀, Tehuantepec, 8 July 1933 [KU]; 1 ♂, Palomares, 5 Sept. 1961 (RRD) [MSU]. YUCATAN: 1 ♀, Merida, 25 July 1962 (HEE) [MCZ]. CHIAPAS: 1 ♂, 9 km. E Pichuacalco, Aug. 1962 (PDH) [CIS]; 1 ♂, Ixtapa, 11 Apr. 1962 (LS) [UCD]; 1 ♀, 13 mi. E Comitán, 3 Aug. 1952 (EG) [CIS]; 1 ♂, 9 mi. SE Buena Vista, 23 Mch. 1953 (RCB & EIS) [CIS]; 1 ♀, 1 ♂, Suchiapa, Mch., July [CIS]; 1 ♂, 4 mi. SE Soyalo, 15 Mch. 1953 (RCB & EIS) [CIS]. GUATEMALA: 1 ♂, Variedades, 500 feet, 29 Aug. 1947 (C. & P. Vaurie) [AMNH]; 1 ♂, Chiquimula, 1000 feet, 21 July 1947 (C. & P. Vaurie) [AMNH]; 1 ♀, Guatemala City (GCC) [BMNH]; 3 ♀♀, Sta. Emilia, Pochuta, 1000 meters, Feb. 1931 (JB) [MCZ]; 2 ♀♀, El Salto, Escuintla, 28 June 1934 (FXW) [MCZ]; 1 ♀, Olas de Moka, Dept. Solola, Sept. [MCZ]; 1 ♂, Los Animales [MCZ]; 1 ♂, Jicaro, May 1931 (JB) [MCZ]. EL SALVADOR: 1 ♂, Santa Cruz Porcillo, 21 Dec. 1953 [USNM]; 1 ♀, 2 ♂♂, Quezaltepeque, June-July 1961 (M. Irwin) [UCD]. HONDURAS: 2 ♀♀, La Ceiba, 25 Aug. 1916 (F. J. Dyer) [USNM]; 1 ♀, Puerto Castillo, July 1945 [OSU]. COSTA RICA: 1 ♂, Coto, 1 June 1958 (J. O. Harrison) [Coll. Harrison]; 1 ♂, Golfito, Puntarenas, 1948 (P. & D. Allen)

[MCZ]; 2 ♀ ♀, Palmar [USNM]; 4 ♀ ♀, 1 ♂, Turrialba, June-July (KWC) [USNM]; 1 ♀, 3 ♂ ♂, 6 mi. W San Ramon, Alajuela Prov., 28 Feb. 1964 (HEE) [MCZ]; 1 ♀, 2 ♂ ♂, Bebedero, Guanacaste Prov., 26 Feb. 1964 (HEE) [MCZ]; 1 ♂, Santa Ana, 24 Feb. 1964 (HEE) [MCZ]; 1 ♂, Liberia to Peñas Blancas, 7 Sept. 1963 (CCP) [MCZ]. PANAMA: 1 ♂, Barro Colorado Isl., Canal Zone, 16 June 1956 (CWR) [KU]; 2 ♀ ♀, 1 ♂, Bella Vista, Aug. 1924 (NB) [MCZ]; 1 ♀, Balboa, 21 Aug. 1914 (T. Hallinan) [MCZ]; 1 ♀, Bugaba (GCC) [BMNH].

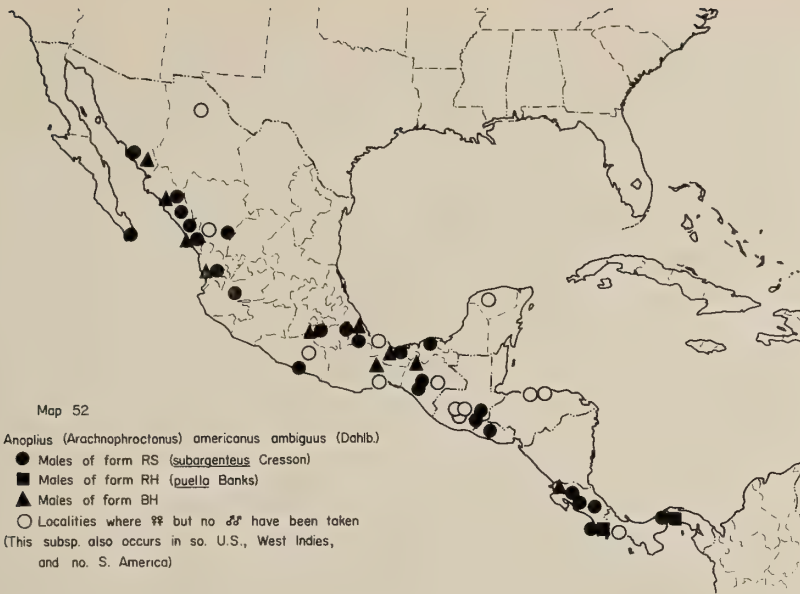
Variation. — The females show much variation in the amount of rufous coloration on the abdomen. This variation shows no close correlation with geography, but certain trends can be noted. Most females from California and from western Mexico (e.g., Sinaloa, Jalisco) have the rufous confined to the first three tergites, extending barely if at all to the sternites. More commonly, throughout much of the range, the coloration extends to the sternites. I have seen specimens in which the rufous coloration extends over most of the first four tergites from Puerto Rico, Hispaniola (type of *coruscus*), the Lesser Antilles, and Panama, while a single specimen from Merida, Yucatan, has the first five tergites rufous as well as much of the venter. In general, females with more rufous on the abdomen tend to have more silvery pubescence. None of this variation is of such a nature that the females can be considered polymorphic or constituting more than a single subspecies.

On the other hand, the males appear to be polymorphic with respect to coloration and the extent of erect hair on the abdomen. The following four forms can be distinguished.

Form RS (= *subargenteus*): abdomen in part rufous, venter essentially smooth (i.e., the hairs are sparse and relatively short). Throughout the range except partially replaced by other forms as described below.

Form RH (= *puella*, *varunus*): abdomen in part rufous, venter with conspicuous brushes of hair. All males I have seen from the West Indies (except Cuba) and the four males seen from South America are of this form; ²⁰ also, one of two males from Panama and one of ten from Costa Rica are of this form, also several from the

²⁰ The type of *varunus*, from British Guiana, two males from Surinam, and a male from Sevilla, Magdalena, Colombia, 15 July 1927 (G. Salt) [MCZ].



coast of Texas (Galveston, Port Isabel).

Form BS (= *albomarginatus*): abdomen black, venter without brushes of hairs. This form is typical of *americanus americanus* and ranges into Texas, but is not known from Mexico, Central America, or the West Indies.

Form BH: abdomen black, venter with brushes of hairs. I have seen males of this form from Sonora, Sinaloa, Nayarit, Morelos, Veracruz, Oaxaca, Chiapas, and Costa Rica (see map 52).

I have seen no specimens from south of the United States which are clearly intermediate between these forms, although one male from Pass Christian, Texas, appears intermediate between RH and RS, and some males from eastern U. S. are intermediate between RS and BS. In several Morelos localities I have taken males of two forms flying together. For example, of 22 males which I took at or near Cuernavaca, 4 were BH and 18 RS; of 16 males taken at Las Estacas, all within one hour along the same irrigation ditch, 2 were BH and 14 RS; of 25 males taken at or near Alpuyeca, 9 were BH and 16 RS. In no case were any intermediates taken. I have studied the genitalia of all four forms carefully and have concluded that all constitute a

single species. However, the genitalia are definitely dimorphic, the parameres of the hirsute males (RH and BH) being very much more hairy on the ventral side than those of the smooth forms (RS and BS); also, the setae on the digiti show a much greater tendency to be capitate in the hirsute forms.

Anoplius (Arachnophroctonus) apiculatus apiculatus (Smith)

Pompilus apiculatus Smith, 1855, Catal. Hymen. Brit. Mus., III, p. 157 [Type: ♀, MEXICO: VERACRUZ (BMNH, no. 19, 642)]. — Cresson, 1867, Trans. Amer. Ent. Soc., 1: 103. — Cameron, 1893, Biol. Centr.-Amer., Hymen. II, p. 205 (Sinaloa, Guatemala).

Pompilus coruscus Smith, 1879, Descr. N. Sp. Hymen. Brit. Mus., p. 155 [Type: ♀, GUATEMALA: Chinantla, 4100 feet (BMNH, no. 19, 565)]. Pre-occupied by Smith, 1855; synonymy by Cameron, 1893.

Anoplius (Pompilinus) apiculatus Viereck, 1906, Trans. Amer. Ent. Soc., 32: 223, 232 (Texas, Arizona).

Anoplius (Arachnophroctonus) apiculatus apiculatus Evans, 1951, Trans. Amer. Ent. Soc., 76: 259-262 (Panama to Texas & Calif.).

Arachnophroctonus apiculatus hondurensis Dreisbach, 1954, Amer. Midl. Nat., 52: 439 [Type: ♂, HONDURAS: Puerto Castilla, 24 March 1924 (JB) (MCZ, no. 29, 318)]. New synonym.

Female. — Length 7-14 mm. Head and thorax black, abdomen wholly orange-brown except extreme base of first segment black, apical segment and sometimes part of penultimate segment usually more or less infuscated; wings hyaline or lightly infuscated, outer margin of fore wing and apex of hind wing broadly infuscated. Almost the entire body clothed with a heavy silvery or somewhat glaucous pubescence, absent from parts of thoracic dorsum but forming a heavy band along the posterior pronotal margin (but Baja California specimens have the silvery pubescence largely replaced by dark). Head and prothorax with rather numerous erect setae, but propodeum without hairs or with only a few fine, pale hairs. Head rather broad, measuring 1.15-1.25 X as wide as high, vertex passing straight across between eye tops. Clypeus broad, nearly or quite 3 X as wide as high, truncate below. Front rather broad, MID .53-.58 X TFD; UID .83-.90 X LID; front with a linear median impression. POL:OOL = 7:6; third antennal segment = .62-.82 X UID. Posterior pronotal margin subarcuate to subangulate. Propodeum with the median line distinctly impressed. Mesosternum produced backward on each side of the midline in the form of short, angular lobes. Front basitarsus with three comb-spines, the spines rather flat, measuring (unless badly worn) from 2-2.5 X as long as the width of the basitarsus. SMC3 rendered triangular or subtriangular by the strong arcuation of the third intercubital vein, occasionally short-petiolate.

Male. — Length 5-9.5 mm. Head and thorax black, abdomen orange-brown except extreme base of first segment black, apical three or four segments

also infuscated; wings hyaline, with a brownish outer marginal band. Body mostly covered with a heavy whitish or somewhat glaucous pubescence, absent from parts of the thoracic dorsum, forming a heavy band on the posterior margin of the pronotum and bands on the posterior margins of the abdominal tergites, the apical tergites densely silvery-pubescent. Propodeum without erect hairs; abdominal venter smooth, with only a few short, suberect setae on the apical segments. Clypeus 2.2-2.6 X as wide as high. Front of moderate breadth, MID .58-.64 X TFD; UID slightly exceeding LID; POL subequal to or slightly exceeding OOL. Antennae with segment three distinctly shorter than four, measuring from 1.8 to 2.3 X as long as thick. Last segment of front tarsus weakly produced on inner margin. Venation as in female. SGP broadly rounded apically, only rather weakly, roundly elevated medially. Genitalia with parameres slender, acuminate, moderately setose; digiti spindle-shaped, all but apical fifth clothed with downward-directed setae which are angled at their apices (see fig. 82 in Evans, 1951).

Distribution. — This species and its various subspecies range from Panama to California, Kansas, Ontario, and Maine. It is not recorded from the West Indies, but there is a male in the MCZ collected on Stranger Cay, Bahamas, by Allen, Barbour, and Bryant in 1904; presumably this specimen is assignable to subspecies *pretiosus*, which is common on the east coast of Florida. Typical *apiculatus* occurs throughout Central America and Mexico at moderate to low elevations, where it inhabits sea beaches and sandy stream-sides; it is also known from Texas, Arizona, and southern California. For U. S. records of this and the other subspecies, see Evans, 1951. (Map 53.)

Mexican and Central American specimens examined. — 114 ♀♀, 93 ♂♂. BAJA CALIFORNIA: 3 ♀♀, Angeles Bay, 26-27 June [CAS]; 1 ♂, La Paz, 3 Jan. [CAS]; 1 ♀, 1 mi. SE Todos Santos, 25 Dec. 1958 (HBL) [CAS]; 1 ♀, 11 mi. S Santa Rosalia, 6 July 1957 (D. Spencer) [CIS]; 1 ♀, Cabo San Lucas, 16 March 1953 (P. H. Arnaud) [CAS]. SONORA: 4 ♀♀, Aduana, 15 Mch. 1962 (FDP) [UCD]; 1 ♀, 10 mi. S Alamos, 13 June 1961 (FDP) [UCD]; 1 ♀, 1 ♂, Cocorit, 11 June 1961 (FDP) [UCD]. SINALOA: 4 ♀♀, 1 ♂, Mazatlan, July-Oct. [MCZ, CAS, BMNH]; 8 ♂♂, 8 mi. SE Elota, 19 May 1962 (FDP) [UCD]; 3 ♂♂, Chupaderos, 15 May 1962 (FDP, LS) [UCD]. NAYARIT: 11 ♀♀, 22 ♂♂, San Blas, Mch., July (HEE, PDH, LS, FDP) [MCZ, CIS, UCD]; 1 ♀, 2 ♂♂, 13 mi. SW Tepic, 23 Mch. 1962 (FDP) [UCD]. GUERRERO: 13 ♀♀, 1 ♂, Acapulco, 1 July 1951 (PDH, HEE) [CIS, MCZ]; 4 ♀♀, 2



♂ ♂, Xalitla, 1500 feet, 20 March 1959 (HEE) [CU, MCZ]; 1 ♂, 16 km. E Chilpancingo, 4700 feet, 30 July 1962 (HEE) [MCZ]; 2 ♀ ♀, Canyon Zopilote, 2000 feet, 30 July 1962 (HEE) [MCZ]. MORELOS: 1 ♀, Lake Tequesquitengo, 1 April 1959 (HEE) [CU]; 1 ♀, Tetecala, 3000 feet, 25 March 1959 (HEE) [CU]; 9 ♀ ♀, 15 ♂ ♂, 3 mi. N Alpuyeca, Mch.-May 1959, 3400 feet (HEE) [MCZ, CU]; 1 ♀, 5 ♂ ♂, S End Cuernavaca, Mch.-May 1959, 4500 feet (HEE) [CU, MCZ]. PUEBLA: 1 ♀, 3 mi. NW Petlalcingo, 3 Apr. 1962 (FDP) [UCD]. VERACRUZ: 1 ♀, 2 ♂ ♂, Tecolutla, 19 June 1951 (HEE) [MCZ]; 8 ♀ ♀, 4 ♂ ♂, Veracruz, June-Aug. [MCZ, CU, MSU, CIS, BMNH]; 1 ♀, 4 mi. W Puerto Mexico, 18 Apr. 1953 (RCB, EIS) [CIS]. OAXACA: 1 ♂, El Camaron, 24 Apr. 1962 (FDP) [UCD]. YUCATAN: 7 ♀ ♀, 9 ♂ ♂, Progreso, 17-23 July 1962 (HEE) [MCZ]. QUINTANA ROO: 2 ♀ ♀, Puerto Juarez, 21 July 1962 (HEE) [MCZ]. CHIAPAS: 2 ♀ ♀, 1 ♂, 7 mi. SE Soyalo, 27 Mch. 1953 (RCB & EIS) [CIS]; 1 ♀, 1 ♂, 5 mi. S San Carlos, 6 Mch. 1953 (RCB & EIS) [CIS]; 1 ♀, Ixtapa, 11 Apr. 1962 (FDP) [UCD]. GUATEMALA: 1 ♀, Chinautla, 4000 feet [BMNH]; 1 ♀, Champerico (GCC) [BMNH]; 1 ♀, 1 ♂, Lake Atitlan, 19 Aug.

1951 (RHP) [MCZ]; 3 ♂♂, Concepcion [USNM]; 18 ♀♀, 6 ♂♂, El Rancho, Feb. [USNM]; 2 ♀♀, Guatemala City, Feb. [USNM]. HONDURAS: 4 ♀♀, 3 ♂♂, Puerto Castilla, 16-24 March 1924 (JB) [MCZ]; 1 ♀, Tela, Mch. [USNM]. NICARAGUA: 1 ♀, San Jorge, 11 Jan. 1938 [AMNH]. PANAMA: 1 ♀, Alhajuela, Mch. [USNM].

Variation. — There is little variation worthy of discussion in this form. The distribution and density of pale pubescence shows considerable variation in both sexes, but especially in the females. As noted above, females from Baja California usually have the pubescence mostly dark, in this respect bearing much resemblance to the eastern U. S. subspecies *pretiosus*.

Anoplius (Arachnophroctonus) semirufus (Cresson)

Pompilus semirufus Cresson, 1867, Trans. Amer. Ent. Soc., 1: 100 [Type: ♀, GEORGIA (ANSP, no. 423)].

Pompilus divisus Cresson, 1867, *ibid.*, p. 100 [Type: ♀, GEORGIA (ANSP, no. 424)]. Synonym by Evans, 1951.

Arachnophila divisa Ashmead, 1902, Canad. Ent., 34: 86.

Arachnodaicter divisus Pate, 1946, Trans. Amer. Ent. Soc., 72: 74.

Anoplius (Arachnophroctonus) semirufus Evans, 1951, Trans. Amer. Ent. Soc., 76: 264-267. — Evans, 1964, Jour. Kansas Ent. Soc., 37: 306 (biology).

Arachnophroctonus apiculatus pretiosus Dreisbach, 1954, Amer. Midl. Nat., 52: 440, 442 (♂, misidentification).

Female. — Length 7-13 mm. Head and thorax black; abdomen encircled with light orange-brown on at least the basal two segments, more often the basal three, sometimes the entire abdomen of this color except the tip infuscated; wings highly infuscated, darker along the outer margins. Pubescence pale, more or less silvery over most of the body. Body with relatively little erect hair in many specimens, none at all on the femora, propodeum, or abdominal dorsum except for the apical tergite; in other specimens there is an abundance of long, black hair on the femora, sometimes even the tibiae and tarsi, also on the entire abdomen and often the propodeum. Clypeus about 3 X as wide as high, truncate below. Front broad, MID .60-.67 X TFD; UID .70-.82 X LID; third antennal segment equal to from .70 to .85 X UID; POL and OOL usually nearly equal. Posterior margin of pronotum subangulate or subarcuate. Propodeum with the median line distinctly impressed. Mesosternum produced backward on each side of the median line in the form of a pair of spiniform processes. Front basitarsus with three comb-spines, the spines from 1.5 to 3 X as long as the width of the tarsus at their bases. SMC3 triangular or nearly so, sometimes short-petiolate, the third intercubital vein

strongly arched.

Male. — Length 5-9 mm. Black, posterior margin of pronotum sometimes with a pale stripe, basal abdominal segments encircled with light orange-brown; wings hyaline or nearly so, outer margins with a darker band. Body extensively covered with silvery pubescence, which tends to form narrow bands at the apices of the abdominal tergites, especially conspicuous on tergites 4-6, which are otherwise mostly dark-pubescent. Propodeum not at all hairy; venter with only some short, inconspicuous setae toward the apex. Clypeus 2.5 X as wide as high. MID .60-.66 X TFD; UID subequal to or slightly less than LID; OOL usually slightly exceeding POL. Antennae slender, segment three 2.4-3.0 X as long as thick, about as long as four. Posterior margin of pronotum broadly angulate. Median line of propodeum impressed. Last segment of front tarsus rather strongly produced on the inner margin. SMC3 subtriangular, triangular, or petiolate. SGP with the disc weakly, roundly elevated medially, bearing short, suberect setae, the apex tapering to a subacute or very narrowly rounded tip. Genitalia very similar to those of the preceding species, but the parameres relatively somewhat long and more strongly setose (see fig. 120 in Evans, 1951).

Distribution. — In the United States this species ranges from Florida and Texas to Montana, Ontario, and New Brunswick (for marginal records, see Evans, 1951). It has not previously been recorded from Mexico and Central America, and in fact is now known only from Morelos and from one specimen from Guatemala. (Map 47.)

Mexican and Central American specimens examined: 13 ♀♀, 16 ♂♂. MORELOS: 11 ♀♀, 9 ♂♂, S end Cuernavaca, Mch.-May 1959, 4500 feet (HEE) [MCZ, CU]; 1 ♂, Cuautla, 5 July 1961 (FPM) [ENAC]; 1 ♀, 2 ♂♂, Puente de Ixtla, 2000 feet, 31 July 1962 (HEE) [MCZ]; 4 ♂♂, Tetecala, 3000 feet, Mch., Aug. (HEE) [MCZ, CU]. GUATEMALA: 1 ♀, Guatemala City (GCC) [BMNH].

Variation. — All the Mexican and Guatemalan females have a certain amount of dark erect hair on the femora and abdominal dorsum, but none on the propodeum. All of them have the abdomen entirely bright orange-brown except for the apical segment, which is variably infuscated. All the males have a strong pale stripe on the posterior margin of the pronotum. In the U. S. specimens I have seen, the apical 2 or to 4 segments of the female abdomen are entirely black and the male has at most an indistinct pale band on the pronotum. Thus the Morelos and Guatemalan population would seem as worthy of subspecific rank as the subspecies of *apiculatus*

now recognized. However, it is possible that when *semirufus* has been more widely collected in Mexico these color differences will be found to vary clinally. Furthermore, the fact that some species have conventionally been split into weak subspecies does not justify this practice for all species.

Subgenus **POMPILINUS** Ashmead

Pompilinus Ashmead, 1902, Canad. Ent., 34: 85 [Type species: *Pompilus cylindricus* Cresson, monobasic]. — Dreisbach, 1949, Ent. Amer., (n.s.) 29: 1-58 (males of U. S. spp.). — Evans, 1951, Trans. Amer. Ent. Soc., 76: 277-325 (U. S. spp.). — Evans, 1956, Ann. Ent. Soc. Amer., 49: 173-177 (Mexican spp.).

Anopliella Banks, 1939, Canad. Ent., 71: 225, 227 [Type species: *Pompilus tenebrosus* Cresson, original designation]. Synonym by Dreisbach, 1950.

Subgeneric characters. — Wholly black or with the abdomen marked with rufous, males only very rarely with a pale stripe on the pronotum; wings of males subhyaline or lightly infuscated, those of females variably infuscated, both sexes with a darker marginal band; body usually without abundant erect hairs, the propodeum hairy in only a few species; male venter without brushes of long hairs, in a few species with mats of short hair on some of the sternites. Clypeus emarginate in only one known species, usually truncate. Female with a tarsal comb, the spines typically very short, not longer than the width of the tarsus, but in a few species they are longer. Last segment of front tarsus of male strongly asymmetrical, the segment widest about half-way from base to apex. Propodeum of male nearly flat in front, distinctly more declivous on the posterior third. Transverse median vein of fore wing meeting the media almost always distinctly beyond the origin of the basal vein; marginal cell short, much more than its own length from the wing tip; SMC3 triangular, usually petiolate, almost always petiolate in the males. Male abdomen slender, cylindrical. Genitalia with the parameres usually broader apically than near the base, but in a few species slender throughout; basal hooklets strong, single.

Distribution. — This subgenus is highly characteristic of the Nearctic region, where there are nearly 20 species, some of them among our commonest Pompilidae. It also occurs in the Palearctic and Ethiopian regions, where it is represented especially by *fuscus* L. and its subspecies. Banks (1947) assigned four South American species to this subgenus, but one (*orthodes*) belongs to *Arachnophroctonus*, and the others are possibly better placed there also. The Mexican and Central American species of this subgenus are all species occur-

ring in the United States or close derivatives thereof. The two known West Indian species are also closely related to U. S. species; these two species are included in the key below and one of them is described herein.

Remarks. — As I discussed in 1951, this is a decidedly weak subgenus, representing little more than one or (more probably) several lineages of *Arachnophroctonus* which have become smaller in size and undergone similar reductions in the tarsal comb and modification in wing venation. Workers in North America find the subgenus convenient to use, and pending a full-scale reclassification of the Pompilidae I shall continue to use it.

*Key to Species Occurring in Mexico, Central America,
and the West Indies*

Females

1. Body entirely black or blue-black 2
 Abdomen in part rufous, orange-brown, or yellowish-brown 9
2. Front basitarsus with three or (more commonly) four comb-spines, the
 spines distinctly longer than the width of the tarsus at their base; head
 wide (TFD 1.15-1.20 X VFD), the vertex passing nearly straight across
 between the eye tops 3
 Front basitarsus with three small comb-spines, the spines not longer than
 the width of the tarsus at their base 4
3. Third antennal segment shorter than one and two together, measuring .45-
 .65 X UID; size small (5.5-10 mm.); clypeus 2.7-3.0 X as wide as high
 *litoreus* Evans
 Third antennal segment longer than one and two together, measuring .65-
 .80 X UID; larger (8-12.5 mm); clypeus 2.5-2.8 X as wide as high
 *californiae* Evans
4. Third antennal segment generally slightly shorter than one and two to-
 gether, measuring at most .75 X UID; vertex forming a weak to fairly
 strong arc between tops of eyes; small species (5-11 mm.) 5
 Third antennal segment generally slightly longer than one and two to-
 gether, measuring at least .68 and usually more than .75 X UID; ver-
 tex passing straight across between eye tops or very weakly arched;
 larger species (5.8-14 mm.) 7
5. Posterior margin of pronotum arcuate or very indistinctly angulate; ver-
 tex arched rather strongly above the eye tops *subcylindricus* (Banks)
 Posterior margin of pronotum forming a sharp angle on the midline; ver-
 tex more weakly arched above the eye tops 6

- ²¹ Described from two females from South Bimini Island in the Bahamas by Embein, 1953, Amer. Mus. Novitates no. 1633, pp. 12-13. This species is not treated further here.

*Males*²²

1. Parameres of genitalia slender throughout; digiti acute apically 2
 Parameres slightly to rather broadly expanded on the apical half 3
2. Digiti strongly bent mesad apically, the setae slightly longer on the outer angles; propodeum with a few dark setae in most specimens
 *leona* (Cameron)
 Inner margins of digiti nearly straight, the upper, outer side with some extremely long setae which are sinuous at their apices; propodeum not or barely hairy *subcylindricus* (Banks)
3. Abdominal sternite four with a dense brush of moderately long setae; SGP unusually slender *texasus* (Dreisbach)
 Abdominal venter smooth, with at most some scattered setae 4
4. Parameres broad to the apex, which is more or less truncate; SGP not much elevated medially, tapering to an obtusely angulate apex
 *insolens* (Banks)
 Parameres tapering to an acute or subacute apex 5
5. SGP unusually slender, narrowly rounded apically; parameres nearly straight, fairly broad throughout, with some hyaline parts on the inner margin and apically; abdomen always marked with rufous
 *fraternus* (Banks)
 SGP broader, more broadly rounded or somewhat angulate apically; parameres not of this form; black or marked with rufous 6
6. Parameres with a moderately wide basal stalk, the squama not forming a strong projection from the stalk; digiti acute apically toward the median line; SGP rounded apically, then with a small median projection 7
 Parameres with a basal stalk which is much more slender than the apical part and from which a very strong squama projects; digiti rounded or rather abruptly truncate apically, sometimes with a small acute portion on the mesal margin; SGP tapering gradually to an angulate apex 11
7. Digiti elongate-fusiform, the hairs on the outer side toward the apex only slightly longer than those on the disc; parameres rather weakly curved mesad apically 8
 Digiti with setae on the outer margin near the apex which are very much longer than those on the disc; parameres rather strongly curved mesad 10
8. SGP very broad, the side-pieces broadly unpigmented; base of digitus giving rise to a small group of setae which are at least about half as long as the digitus *estellina* (Banks)

²² Males of this subgenus are all much alike superficially, and identification is possible only upon examination of the genitalia and SGP. In my key in 1951 (pp. 281-284) I used some external characters and also provided figures of the subgenital plate and genitalia of all the species occurring in the United States. The following key, based almost entirely upon the terminalia, is best used in conjunction with my 1951 paper.

- SGP less broad and much less broadly unpigmented on the sides; base of digitus with the setae shorter than above 9
9. Propodeum at most rather weakly hairy; digiti much shorter than parameres; aedoeagus narrowly expanded apically *litoreus* Evans
 Propodeum with strong hairs in most specimens; digiti very large, nearly as long as parameres; aedoeagus broadly expanded on apical half
 *californiae* Evans
10. Parameres widest near their middle; digiti slender, densely clothed with setae which are angled at their apices; wholly black *clystera* (Banks)
 Parameres widest on the outer third; digiti wider and less densely clothed with angulate setae; abdomen often in part rufous
 *splendens* (Dreisbach)
11. Digiti more or less truncate apically (continental U. S. and Mexico)
 *cylindricus* (Cresson)
- Digiti evenly rounded apically (West Indies) *hispaniolae* n. sp.

Anoplius (*Pompilinus*) *leona* (Cameron) new combination

Pompilus leona Cameron, 1893, Biol. Centr.-Amer., Hymen. II, p. 198, pl. XI, fig. 20 [Type: ♀, MEXICO: GUERRERO: Xucumanatlán, July, 7000 feet (HHS) (BMNH, no. 19, 684)].

Pompilus leonus Dalla Torre, 1897, Catal. Hymen., VIII, p. 298.

Anoplius (*Pompilinus*) *grandiflexionis* Evans, 1950, Jour. Kansas Ent. Soc., 23: 84-85 [Type: ♂, TEXAS: Fort Davis, 26 July 1946 (HEE) (USNM, no. 59, 474)]. — Evans, 1951, Trans. Amer. Ent. Soc., 76: 284-286. — Evans, 1956, Ann. Ent. Soc. Amer., 49: 173-177 (Durango, Zacatecas). New synonym.

Although there are some slight differences between specimens from the extremities of the range of this species, as discussed further below, there is little question that the above synonymy is correct. The type of *leona* is a female, not a male as stated by Cameron. This specimen agrees well in most details with Cameron's description, and there is little question that it is actually the true type. Cameron's remark that the sides of the propodeum project "as blunt teeth" is presumably an error of observation or recording.

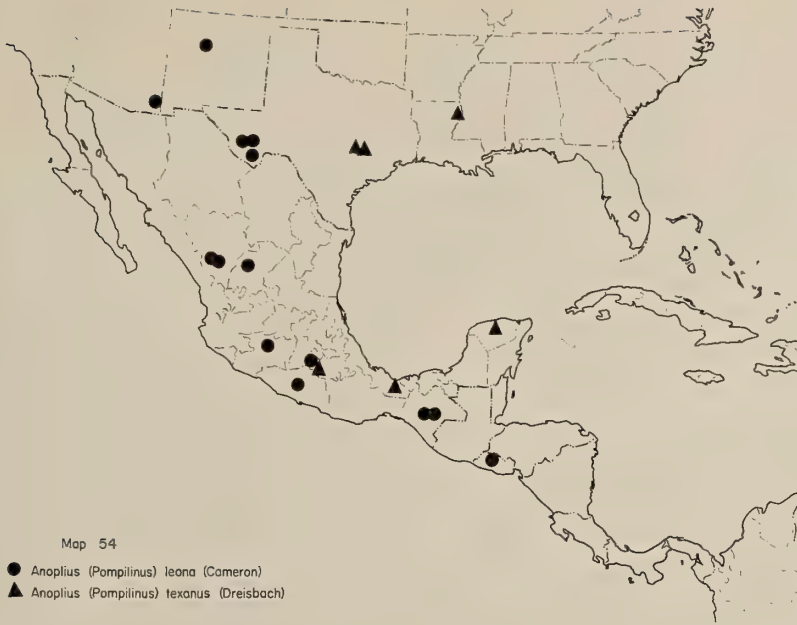
Description of type female. — Length 9 mm.; fore wing 8 mm. Color black, body clothed with a rich, dark blue pubescence; wings wholly infuscated, strongly violaceous. Erect setae numerous on clypeus and front; front coxae with strong setae; pronotum with a few weak setae; propodeum with several fairly long setae on each side. Clypeus 2.4 X as broad as high, truncate below. Head 1.12 X as wide as high; front narrow, MID .55 X TFD, 1.15 X LID, .75 X eye height; UID .90 X LID. POL:OOL = 1:1. First four

antennal segments in a ratio of about 13:3:17:14, segment three about 4 X as long as thick, .80 X UID. Vertex passing straight across a very short distance above the eye tops. Posterior margin of pronotum broadly, weakly angulate. Propodeum with a weak median impression; slope rather even from front to rear, the central part of the declivity rather flat. Front basitarsus with three comb-spines, the spines about as long as the width of the tarsus at their bases. Fore wing with the transverse median vein reaching the median vein considerably beyond the basal; marginal cell removed from wing tip by 1.3 X its own length; SMC3 short-petiolate.

Male. — Length 6-11.5 mm. Black; posterior margin of pronotum rarely with a pale stripe; pubescence silvery on much of the head, thoracic pleura, leg-bases, and propodeum at least behind, elsewhere rather strongly reflecting bluish. Front with considerable dark, erect hair; pronotum and propodeum with a few dark setae in most specimens; venter with only a very few rather inconspicuous setae, sternites four and five typically with the pubescence a little longer and more erect than elsewhere, forming very indistinct mats. Clypeus 2.2-2.5 X as broad as high. Front fairly broad, MID .60-.70 X TFD; UID 1.0-1.12 X LID; POL subequal to or slightly less than OOL. Third antennal segment 2.5-3.2 X as long as wide, about as long as four. Pronotum subangulate behind. SGP of moderate breadth, the apex broadly rounded, the median line barely elevated. Genitalia with the parameres slender, slightly curved; digitus somewhat triangular, acute apically, clothed with setae which are longest at the outer angles; base of digitus with several very long setae; aedoeagus moderately broad, weakly bilobed apically, embraced by slender parapenial lobes (see fig. 87 in Evans, 1951).

Distribution. — Arizona and western Texas to El Salvador, throughout the range apparently occurring in open country at moderate to fairly high elevations. In addition to the New Mexico and west Texas localities cited in 1951, I have taken the species in series at the Southwestern Research Station, Portal, Arizona, at about 5400 feet elevation. (Map 54.)

Mexican and Central American specimens examined. — 14 ♀♀, 21 ♂♂. DURANGO: 1 ♀, 5 mi. E Coyotes, 4 Aug. 1951 (HEE) [MCZ]; 5 ♂♂, El Salto, 3 Aug. 1951 (HEE, PDH) [CU, MCZ, CIS]. ZACATECAS: 9 ♂♂, 15 km. E Sombrerete, 28-31 July 1951 (HEE, PDH) [CU, MCZ, CIS]. MICHOACAN: 1 ♀, 60 mi. E Zamora, 24 June 1957 (Chemsak & Rannells) [CIS]. MORELOS: 7 ♀♀, 3 ♂♂, 3-4 mi. NW Cuernavaca, May, June 1959, 6500-7500 feet (HEE) [MCZ, CU]. GUERRERO: 1 ♀, Xucumanatlán, 7000 feet, July (HHS) [BMNH]. CHIAPAS: 1 ♂, Nachic, 8000 feet, 27 April 1959 (HEE) [MCZ]; 4 ♀♀, 20 mi. W San Cristobal las Casas, May,



Aug. 5600-6000 feet (HEE, HAS) [MCZ, OSU]; 2 ♂♂, 8-35 mi. E San Cristobal las Casas, July, Aug. (Chemsak & Rannells) [CIS]. EL SALVADOR: 1 ♂, Cerro Verde, 6800 feet, 5 July 1963 (HAS) [OSU].

Variation. — The available females vary in size from 8-13 mm. MID varies from .52 to .57 X TFD; the amount of erect hair on the propodeum is rather variable. The most notable variation in this series pertains to the antennae, which tend to be shorter toward the more southern parts of the range. In U. S. specimens, antennal segment three varies from .90 to 1.0 X UID; in the one Durango female this figure is .86, in the one Michoacan female .76, in seven Morelos females .72-.79, in the one Guerrero female .80, and in 4 Chiapas females .75-.80.

The Texas male which I selected as holotype of *grandiflexionis* is the only male I have seen which has a pale stripe on the pronotum. This male is also unusually large, measuring 11.5 mm., while the largest Mexican male before me measures 9 mm. As in the female, the amount of erect hair on the propodeum is somewhat variable, but all the Mexican and Central American males have at least a few

setae on each side. The mats of short hair on the venter described for the type of *grandiflexionis* are barely discernible in most specimens. Only very minor variation can be noted in the genitalia.

Anoplius (Pompilinus) subcylindricus (Banks)

Pompiloides subcylindricus Banks, 1917, Bull. Mus. Comp. Zool., 61: 103

[Type: ♀, VIRGINIA: Falls Church, Aug. (NB) (MCZ, no. 10, 015)].

Anoplius (Pompilinus) subcylindricus Evans, 1951, Trans. Amer. Ent. Soc., 76: 286-288. — Evans, 1956, Ann. Ent. Soc. Amer., 49: 174 (Mexican records).

Female. — Length 5.5-11 mm. Black; pubescence wholly dark, slightly violaceous; specimens from central Mexico (Michoacan and Puebla to Guerrero) with the pubescence strongly bluish, the wings violaceous. Propodeum not or very barely hairy. Clypeus 2.5-2.7 X as broad as high, truncate below. Head rather broad, TFD about 1.12 X VFD; vertex forming an even arc above the eye tops. Front broad, MID .60-.65 X TFD; UID .85-.95 X LID; POL usually slightly exceeding OOL. Antennal segment three not longer than one and two together, equal to from .54 to .70 X UID. Posterior margin of pronotum arcuate, at most with a very vague median angulation. Propodeum short and convex. Front basitarsus with three comb-spines, the spines about as long as the width of the basitarsus.

Male. — Length 4.5-9 mm. Black; pubescence extensively silvery; propodeum without erect hairs. S4 (to a lesser extent 5) with a dense mat of very short, suberect setae. Front broad, MID .61-.67 X TFD; UID 1.0-1.1 X LID; ocelli in a broad triangle, POL slightly exceeding OOL. Antennal segment three 1.6-2.2 X as long as wide, distinctly shorter than fourth segment. Posterior margin of pronotum arcuate or with a vague median angulation. SGP of moderate width, nearly parallel-sided, the apex rounded or obtusely pointed, the plate somewhat tectiform. Genitalia with the parameres slender, nearly straight; digiti large, their inner margins nearly straight, with some minute setae on the inner margin apically and some long setae which are sinuous apically on the upper, outer margin; aedoeagus gradually expanded from base to apex, which is subtruncate (see fig. 88 in Evans, 1951).

Distribution. — Utah, North Dakota, and Quebec to Florida and to Guerrero, in Mexico occurring in open country above 5000 feet elevation. (Map 55.)

Mexican specimens examined. — 23 ♀♀, 34 ♂♂. CHIHUAHUA: 1 ♀, 2 mi. S Matachic, 21 Aug. 1950 (RFS) [AMNH]; 1 ♂, San José Babicora, 5 July 1947 (MC) [AMNH]; 1 ♀, 18 mi. W Jimenez, 10 Aug. 1951 (HEE) [CU]. DURANGO: 4 ♀♀, 8 mi. S Canutillo, 9 Aug. 1951 (HEE, PDH) [MCZ, CU, CIS]; 1 ♀, 1 ♂, Nombre de



Dios, 1-5 Aug. (HEE) [MCZ]. ZACATECAS: 6 ♀♀, 16 ♂♂, 15 km. E Sombrerete, 7300 feet, 28-31 July 1951 (HEE, PDH) [MCZ, CU, CIS]. JALISCO: 2 ♀♀, 2 ♂♂, Villa Guadalupe, 26 July 1951 (HEE, PDH) [MCZ, CU, CIS]. MICHOACAN: 4 ♀♀, 10 km. W Zitacuaro, 8000 feet, 11 July 1951 (PDH, HEE) [CIS, MCZ]; 1 ♀, 9 mi. SW Morelia, 21 Aug. 1962, 6800 feet (RHP) [MCZ]. QUERETARO: 1 ♂, 10 mi. E San Juan del Rio, 6500 feet [KU]. MEXICO: 3 ♀♀, Teotihuacan, 7500 feet, July (HEE, RRD) [MCZ, MSU]; 1 ♂, Atlacomulco, 8000 feet, 18 Aug. 1954 (J. G. Chillcott) [CNC]. PUEBLA: 2 ♀♀, 55 mi. SE Puebla, 6600 feet, 7 June 1956 (HAS) [OSU]; 1 ♀, 20 mi. W Puebla, 29 Dec. 1940 (GEB) [CIS]; 12 ♂♂, 14 mi. W Huauchinango, 7000 feet, 17 June 1951 (PDH, HEE) [CIS, CU, MCZ]. MORELOS: 1 ♀, 3 mi. NW Cuernavaca, 28 June 1959, 6500 feet (HEE) [MCZ]. GUERRERO: 1 ♀, Almolongo, 6000 feet, 29 July 1962 (HEE) [MCZ].

Variation. — As noted above, females from central Mexico (Michoacan, Mexico, Puebla, Morelos, Guerrero) are decidedly bluer than those from farther north, and also have the wings more strongly bluish-refulgent. There are, however, no noticeable differences in size or structural details. The males from this area also have the

dark parts of the pubescence somewhat more bluish; they also have the mat of hairs on S4 distinctly longer than those from farther north, longer even than the Jalisco specimens.

Anoplius (Pompilinus) texanus (Dreisbach)

Pompilinus texanus Dreisbach, 1949, Ent. Amer., (n.s.) 29: 14-15 [Type: ♂, TEXAS: Lee Co., May 1907 (Birkman) (MCZ, no. 29, 324)]. — Dreisbach, 1952, Amer. Midl. Nat., 48: 145, 159.

Anoplius (Pompilinus) texanus Evans, 1951, Trans. Amer. Ent. Soc., 76: 290-291. — Evans, 1956, Ann. Ent. Soc. Amer., 49: 174 (Morelos, Mexico).

The female of this species has not previously been described. The species occurs widely in Mexico but appears to be uncommon.

Female. — Length 7-10 mm. Black; pubescence wholly dark, reflecting shades of deep blue in certain lights. Pronotum with a few short setae, propodeum without setae. Clypeus 2.4-2.5 X as wide as high, its apical margin truncate. Head 1.10-1.13 X as wide as high; vertex very slightly, arcuately elevated above eye tops (much less so than in *subcylindricus*). Front of moderate breadth, MID .58-.61 X TFD; UID .85-.90 X LID; ocelli in a broad triangle, POL:OOL = 6:5. First four antennal segments in a ratio of about 21:7:26:22, segment three equal to from .68 to .75 X UID. Posterior margin of pronotum with a distinct median angulation. Propodeum rather short, with an oblique, nearly flat declivity. Front basitarsus with three comb-spines, the spines about as long as the width of the tarsus.

Male. — Length 5.5-8 mm. Black; pubescence extensively silvery, tending to be rather coarse on the propodeal slope. Body without conspicuous erect hairs except for a few on the head and prothorax, also a dense brush of hairs of moderate length on S4. Clypeus 2.2-2.4 X as wide as high. MID .59-.60 X TFD; UID very slightly greater than LID; POL very slightly greater than OOL. Third antennal segment about 2.2-2.4 X as long as wide, about as long as fourth segment. Pronotum broadly angulate behind. SGP unusually slender, somewhat parallel-sided, covered with short, suberect hairs. Genitalia with the parameres distinctly wider than in *subcylindricus* and the inner margin of the digiti more sinuate than in that species, but the genitalia otherwise very similar (see figs. 128 and 155 in Evans, 1951; also fig. 37 in Dreisbach, 1949, and fig. 13 in Dreisbach, 1952).

Distribution. — Louisiana and Texas to Morelos and to Yucatan. See Evans, 1951, for U. S. records. (Map 54.)

Mexican specimens examined. — 7 ♀♀, 1 ♂. MORELOS: 1 ♀, 1 ♂, Alpuyecá, about 3000 feet, 27 June, 3 July 1951 (HEE, PDH) [MCZ]. VERACRUZ: 5 ♀♀, Minatitlán, 26 Aug.-1 Sept. 1961 (RRD) [MSU]. YUCATAN: 1 ♀, 10 km. W Kantunil, 18 July 1962

(HEE) [MCZ].

Anoplius (Pompilinus) estellina (Banks)

Pompiloides estellina Banks, 1914, Jour. N. Y. Ent. Soc., 22: 303 [Type: ♂, CALIFORNIA: Fosters, San Diego Co., 29 May (E. P. VanDuzee) (MCZ, no. 13, 673)].

Anoplius (Pompilinus) estellina Evans, 1951, Trans. Amer. Ent. Soc., 76: 299-301. — Evans, 1956, Ann. Ent. Soc. Amer., 49: 176 (Mexico and Guatemala). — Evans, 1956, Ent. News, 67: 7-8.

Pompilinus utahensis Dreisbach, 1952, Amer. Midl. Nat., 48: 145-146 [Type: ♂, UTAH: Castle Dale, 24 June 1941 (G. F. Knowlton) (USNM, no. 63, 096)]. Synonymy by Evans, 1956.

Pompilinus minutus Dreisbach, 1952, *ibid.*, pp. 147-148 [Type: ♂, MEXICO: MICHOACAN: Tancitaro, 6600 feet, 2-5 July 1940 (Hoogstraal & Knight) (? location of type)]. Synonymy by Evans, 1956.

Female. — Length 5-8 mm. Black; pubescence wholly dark, obscurely reflecting bluish. Head and prothorax with numerous dark setae; propodeum with a few fairly strong, dark setae on the sides. Clypeus 2.5-2.8 X as broad as high, truncate or slightly concave below. Head 1.10-1.14 X as wide as high; vertex forming a slight arc extending very slightly above the eye tops, as in *texanus*. Front broad, MID .59-.65 X TFD; UID .85-.95 X LID; POL equal to or very slightly exceeding OOL. First four antennal segments in a ratio of about 25:10:32:28, segment three thus considerably shorter than one and two together, measuring .56-.69 X UID. Posterior margin of pronotum angulate. Other features as described for *texanus*.

Male. — Length 4.5-8 mm. Black; pubescence extensively silvery; propodeum sometimes with a few weak hairs on the sides. Clypeus 2.2-2.4 X as wide as high. MID .62-.67 X TFD; UID subequal to or slightly exceeding LID; POL equal to or slightly exceeding OOL. Third antennal segment 2.0-2.3 X as long as wide, slightly shorter than fourth segment. Pronotum broadly angulate behind. Venter smooth, with no evidence of hair-mats. SGP broad, the median line strongly elevated and pigmented, the side-pieces broadly unpigmented, semi-transparent. Genitalia with the parameres slightly curved, rather narrow (although wider than in *subcylindricus*), with few setae on the ventral surface but many on the dorsal; digiti elongate, the tip forming a small, angular process, surface covered with small setae which are longer on the upper, outer side; volsella with some very long setae arising at the base of the digitus; parapenial lobes straight, widened apically; aedoeagus abruptly expanded at the extreme tip (see fig. 93 in Evans, 1951, also figs. 7 and 15 in Dreisbach, 1952).

Distribution. — Western North America, from Alberta to Guatemala. In Mexico this species occurs in open country at moderate to



fairly high elevations, often near water. Since presenting U. S. records for this species in 1951, I have seen many additional specimens from Arizona (Cochise Co.). (Map 56.)

Mexican and Central American specimens examined. — 10 ♀♀, 14 ♂♂. ZACATECAS: 1 ♀, 9 mi. N Ojo Caliente, 12 May 1962 (LS) [UCD]. MICHOACAN: 1 ♂, Tancitaro, 6600 feet, 2-5 July 1940 [type of *minutus*]. QUERETARO: 2 ♀♀, 3 ♂♂, Palmillas, 7000 feet, 8 Aug. 1962 (HEE) [MCZ]. MEXICO: 1 ♂, Chapingo [ENAC]; 4 ♀♀, 3 ♂♂, Valle de Bravo, 6500 feet, 3 Aug. 1962 (HEE) [MCZ]; 2 ♂♂, 34 km. W Toluca, 8500 feet, 9 Aug. 1962 (HEE) [MCZ]. PUEBLA: 1 ♀, 2 ♂♂, 14 mi. W Huauchinango, 7000 feet, 17 June 1951 (PDH) [CIS, MCZ]. OAXACA: 1 ♂, Oaxaca, 5000 feet, 20 July 1937 (GEB) [CIS]; 1 ♀, 2 mi. NW Tamazulapan, 6000 feet, 28 June 1961 [KU]. CHIAPAS: 1 ♀, 16 mi. NW Comitán, 3 Aug. 1952 (EG & CM) [CIS]. GUATEMALA: 1 ♂, Cristobal, Tonicopan, 16 Aug. 1952 (RHP) [MCZ].

Anoplius (Pompilinus) litoreus Evans

Anoplius (Pompilinus) litoreus Evans, 1956, Ann. Ent. Soc. Amer., 49: 175-176 [Type: ♂, MEXICO: NAYARIT: San Blas, 20 July 1951 (HEE)]

(USNM, no. 62, 901)].

Female. — Length 5.5-10 mm. Black; pubescence conspicuously silvery on the lower front and temples, often over much of the head and thorax, including the leg-bases and propodeum. Amount of erect hair rather variable; propodeum with or without erect hairs. Head about 1.15 X as wide as high, the vertex straight across between the eye-tops. Clypeus 2.7-3.0 X as wide as high, its apical margin very slightly concave. MID .55-.63 X TFD; UID .80-.90 X LID; POL:OOL = 7:6. Third antennal segment much shorter than one and two together, scarcely longer than scape, measuring from .45 to .65 X UID. Pronotum broadly angulate behind. Propodeum convex, with a well-defined, oblique declivity. Front basitarsus with four comb-spines, the spines (except sometimes the most basal one) distinctly longer than the width of the tarsus.

Male. — Length 4-8.5 mm. Black; pubescence extensively silvery; propodeum only occasionally with a few erect hairs. Clypeus slightly more than twice as wide as high. MID .59-.65 X TFD; UID 1.0-1.1 X LID; POL:OOL = 7:6. Third antennal segment 2.0-2.3 X as long as thick, subequal to or slightly shorter than fourth segment. Venter smooth, with only a very few short, suberect setae, except SGP rather roughly setose, the setae fairly long medially and apically; SGP fairly wide, its midline somewhat elevated. Genitalia with the parameres somewhat expanded on the apical half, with strong setae; digiti elongate, bearing short setae most of which are angled at their apices; volsella with only some very short setae at the base of the digitus; aedoeagus subangularly expanded at the apex (see figs. 1 and 2 in Evans, 1956).

Distribution. — This species is restricted to sea beaches on the west coast of Mexico, from Oaxaca to Sinaloa. (Map 56.)

Specimens examined. — 82 ♀♀, 88 ♂♂. OAXACA: 1 ♂, Isla Natar, Juchitan Dist., 8 March 1948 (T. MacDougal) [AMNH]. GUERRERO: 12 ♀♀, Acapulco, 1 July 1951 (HEE, PDH) [MCZ, CU, CIS, CAS]. COLIMA: 2 ♀♀, 3 mi. NW Manzanillo, 26 Aug. 1962 (RHP) [MCZ]. NAYARIT: 26 ♀♀, 27 ♂♂, San Blas, July, Sept. (HEE, PDH, RRD) [MCZ, CU, CIS, ENAC, MSU, CAS, USNM]; 1 ♂, Rio de las Canyas, 8 mi. NW Acaponeta, 25 Nov. 1948 (HBL) [CAS]. SINALOA: 20 ♀♀, 15 ♂♂, Mazatlan, May, July, Aug., 1959, 1962 (HEE, FDP) [CU, ENAC, MCZ, UCD]; 22 ♀♀, 44 ♂♂, 8 mi. SE Elota, 19 May 1962 (FDP) [UCD].

Variation. — The females from Acapulco and from Manzanillo differ from those from Nayarit and Sinaloa in having the propodeum rather hairy in all specimens, and in some the mesopleura, middle and hind coxae, and even the femora are hairy. Also, in the Acapulco series the front is consistently rather broad (MID .60-.63 X

TFD), the third antennal segment very short (.45-.50 X UID). Females from Nayarit and Sinaloa have at most a trace of hair on the propodeum, and in nearly all specimens the third antennal segment is more than .50 X UID.

Anoplius (Pompilinus) californiae Evans

Pompilus tenebrosus Fox, 1893, Proc. Calif. Acad. Sci., (2)4: 9 (Baja Calif.). — Fox, 1895, Proc. Calif. Acad. Sci., (2)5: 265 (Baja Calif.). (Not *tenebrosus* Cresson; misidentification.)

Anoplius (Pompilinus) californiae Evans, 1948, Pan-Pac. Ent., 24: 128-129 [Type: ♀, BAJA CALIFORNIA: La Paz, 3 June 1921 (E. P. VanDuzee) (CAS, no. 5949)]. — Evans, 1951, Trans. Amer. Ent. Soc., 76: 297-299. — Evans, 1956, Ann. Ent. Soc. Amer., 49: 175.

This species resembles the preceding closely and probably shared a common ancestry with it. Unlike *litoreus*, however, this species is by no means confined to sea beaches.

Female. — Length 8-12.5 mm. Black; wings moderately infuscated, often somewhat violaceous; pubescence dark, obscurely bluish, often silvery on base of mandibles, sometimes also on sides of clypeus and face. Body rather hairy for the subgenus; thoracic dorsum with scattered erect setae, propodeum with numerous strong setae, femora often with short setae. Head very wide, 1.15-1.20 X as wide as high, the vertex nearly straight between the eye-tops. Clypeus 2.5-2.8 X as wide as high, truncate below. MID .56-.62 X TFD; UID .85-.95 X LID; POL equal to or slightly exceeding OOL. Third antennal segment longer than first two together, equal to from .65 to .80 X UID. Pronotum broadly angulate behind. Front basitarsus with three or (more commonly) four comb-spines, the spines 1.3-2.0 X as long as the width of the tarsus (except the basal one often shorter).

Male. — Length 6.5-9.5 mm. Black; pubescence dark, except silvery on temples and front of head, sometimes on parts of the thorax. Front with dense erect hair; thoracic dorsum with a few erect hairs; propodeum unusually hairy for this subgenus. Clypeus 2.1-2.3 X as wide as high. MID .59-.62 X TFD; UID subequal to or slightly exceeding LID; POL:OOL = about 10:9. Third antennal segment 2.0-2.8 X as long as wide. Venter with sparse, small setae, subgenital plate by no means as roughly setose as in *litoreus*. SGP broad, somewhat elevated medially, its apex broadly rounded or obtusely angulate. Genitalia much like those of *litoreus* but the digits larger (only slightly shorter than the parameres), the aedoeagus more broadly and roundly expanded apically (see fig. 92 in Evans, 1951).

Distribution. — New Mexico, Nevada, and California to Sonora and the whole of Baja California. For U. S. records, see Evans,

1951; the Nevada record is new (a series of both sexes from Glendale, Clark Co., 13 May 1961 [CIS]). (Map 56.)

Mexican specimens examined. — 11 ♀♀, 3 ♂♂. SONORA: 1 ♀, MacDougal Crater, Pinacate Mts., 28 Nov. 1959 (G. D. Butler) [UA]; 3 ♀♀, between Sonoyta and Punto Penasco, 500 feet, 25 March 1949 (G. M. Bradt) [AMNH, MCZ]. BAJA CALIFORNIA: 1 ♀, Angeles Bay, 7 May 1921 (E. P. VanDuzee) [USNM]; 1 ♀, 2 ♂♂, La Paz, 3 June 1921 (E. P. VanDuzee) [CAS]; 2 ♀♀, 19.2 mi. W La Paz, 31 Dec. 1958 (HBL) [CAS]; 1 ♀, 1 ♂, Bahia de los Muertos, 20 Dec. 1958 (HBL) [CAS]; 1 ♀, Magdalena Bay, 30 May [CAS]; 1 ♀, Cabo San Lucas, 16 March 1953 (P. H. Arnaud) [CAS].

Anoplius (Pompilius) insolens (Banks)

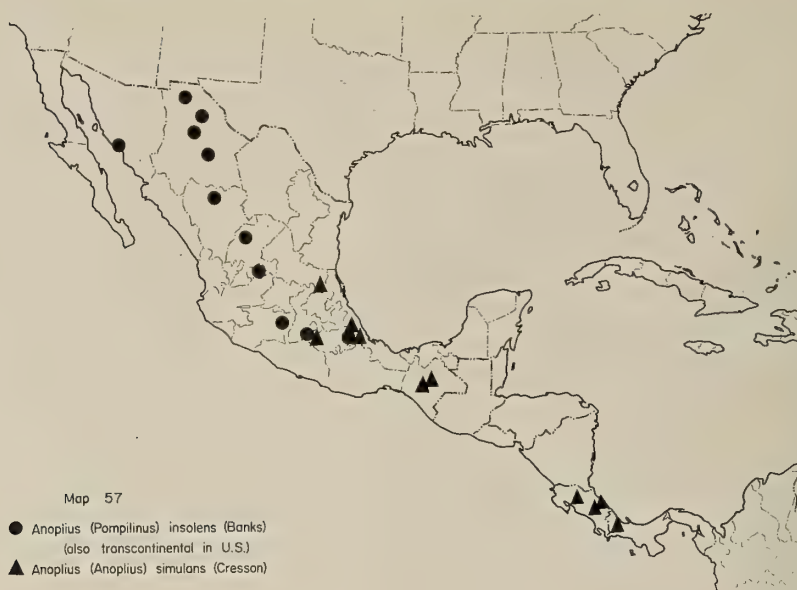
Pompiloides insolens Banks, 1912, Jour. N. Y. Ent. Soc., 19: 226 [Type: ♂, NORTH CAROLINA: Black Mt., May (MCZ, no. 13, 681)].

Pompilius insolens Dreisbach, 1949, Ent. Amer., (n.s.)29: 28, 33, 50.

Anoplius (Pompilius) insolens Evans, 1951, Trans. Amer. Ent. Soc., 76: 304-306. — Evans, 1956, Ann. Ent. Soc. Amer., 49: 176 (Mexico).

Female. — Length 7.5-14 mm. Black; pubescence wholly dark, somewhat bluish or violaceous. Body with considerably less hair than in the preceding species; propodeum always with a few very short, fine hairs on the sides. Clypeus about 2.5 X as broad as high, truncate or slightly concave below. Head slightly wider than high, TFD not more than about 1.12 X VFD; vertex straight across between eye-tops or arched very weakly. Front broad, MID .56-.61 X TFD, averaging about .58; UID .80-.92 X LID; POL equal to or slightly greater than OOL. Third antennal segment slightly longer than one and two together, equal to from .68 to .84 X UID. Posterior margin of pronotum subangulate, not forming a clearly defined angle on the median line as, for example, in *estellina*. Front basitarsus with three comb-spines, the spines very short, not longer than the width of the tarsus.

Male. — Length 6.5-11 mm. Black; pubescence of variable coloration, often silvery over a considerable part of the head and thorax. Body mostly smooth and without erect hairs, the propodeum without hairs or with a few very short ones. Clypeus twice as broad as high; MID .58-.63 X TFD; UID equal to or very slightly exceeding LID; POL usually slightly exceeding OOL; third antennal segment 2.4-3.0 X as long as wide, about as long as fourth segment. Venter smooth, with only scattered, short hairs. SGP also rather smooth, the median line not distinctly elevated, the apex obtusely angulate. Genitalia with the parameres gradually expanded nearly to the apex, which is subtruncate, the inner margin with a series of strong setae on the outer half; digiti rather slender, with delicate setae which are angled at their apices, ex-



cept with some much stronger setae on the upper, outer side; aedoeagus parallel-sided, angularly expanded at the apex (see fig. 95 in Evans, 1951, also fig. 43 in Dreisbach, 1949).

Distribution. — This species occurs transcontinentally in temperate North America, north to British Columbia, Ontario, and Maine, south to Georgia, Texas, the Mexican central plateau to the high parts of Veracruz and Morelos, and to California. (Map 57.)

Mexican specimens examined. — 21 ♀♀, 4 ♂♂. CHIHUAHUA: 2 ♀♀, Santa Clara, 2 July 1947 (WG) [AMNH]; 1 ♀, 16 mi. SE Chihuahua, 11 July [AMNH]; 2 ♀♀, 82 mi. S Juarez, 4000 feet, 15 Aug. 1957 (HAS) [OSU]; 1 ♀, Guzman, 4400 feet, Aug. 1906 (P. P. Calvert) [ANSP]; 1 ♀, 10 mi. S Villa Ahumada, 4 July 1954 (E. I. Schlinger) [CIS]. SONORA: 1 ♀, Guaymas, 10 April (L. O. Howard) [USNM]. DURANGO: 1 ♀, 8 mi. S Canutillo, 9 Aug. 1951 (HEE) [MCZ]. ZACATECAS: 1 ♀, 15 km. E Sombrerete, 7300 feet, 28-31 July 1951 (PDH) [CIS]. AGUASCALIENTES: 1 ♀, Aguascalientes, 26 June 1952 (EG & CM) [CIS]. MICHOACAN: 1 ♀, 1 ♂, 10 km. W Zitacuaro, 8000 feet, 11 July 1951 (HEE) [MCZ]. MORELOS: 8 ♀♀, 3 ♂♂, 3 mi. NW Cuernavaca, 6500 feet, May-June 1959 (HEE) [CU, MCZ]. VERACRUZ: 1 ♀, 5 mi. E Acultzingo, 5000 feet, 9 June 1959 (HEE) [MCZ].

Anoplius (Pompilinus) clystera (Banks)

Pompiloides clystera Banks, 1914, Jour. N. Y. Ent. Soc., 22: 302 [Type: ♂, CALIFORNIA: Stanford Univ. (MCZ, no. 13, 675)].

Pompilinus clystera Dreisbach, 1949, Ent. Amer., (n.s.)29: 27, 38, 42.

Anoplius (Pompilinus) clystera Evans, 1951, Trans. Amer. Ent. Soc., 76: 307-309. — Evans, 1956, Ent. News, 67: 7. — Evans, 1956, Ann. Ent. Soc. Amer., 49: 176-177 (Mexican records).

Pompilinus submarginatus Dreisbach, 1952, Amer. Midl. Nat., 48: 146-147 [Type: ♂, UTAH: Delta, 25 June 1949 (G. F. Knowlton) (USNM, no. 63, 095)]. Synonymy by Evans, 1956.

This species occurs widely in the western half of the United States, and it is entirely logical that it should occur throughout much of the Mexican central plateau. Specimens from as far south as Oaxaca are here assigned to *clystera*. However, the only Mexican male I have seen is from a locality in Baja California only a short distance from the U. S. border. The others are all females, and although they seem to fall readily within the range of variation of *clystera* as that is presently understood, it should be emphasized that characterization of the females in this subgenus is difficult. Pending the capture of males from localities deeper in Mexico, the assignment of females from central and southern Mexico to *clystera* must be considered tentative.

Female. — Length 5.8-13 mm. Black; pubescence entirely dark, often with obscure bluish reflections. Propodeum without erect hairs or with a few short, fine hairs on the sides. Clypeus 2.4-2.7 X as wide as high, truncate below. Head about 1.10 X as wide as high, vertex passing straight across between eye-tops or arching very weakly. Front narrow, MID .53-.57 X TFD; UID .85-.95 X LID; POL:OOL=5:4. Third antennal segment at least as long as first two together, equal to from .70 to .90 X UID. Posterior margin of pronotum angulate. Front basitarsus with three comb-spines, the spines about as long as the width of the tarsus.

Male. — Length 5.5-11 mm. Black; pubescence often extensively silvery, sometimes mostly or even wholly dark, with obscure bluish reflections. Clypeus 2.0-2.3 X as wide as high. MID .58-.64 X TFD; UID 1.0-1.1 X LID; POL:OOL=5:4. Third antennal segment about 2.5 X as long as thick, about as long as fourth segment. Venter smooth, with only a few small setae. SGP of moderate breadth, its median line strongly elevated, side broadly unpigmented or weakly pigmented. Genitalia with the parameres fairly broad, tapering apically, strongly curved; digiti slender, mostly covered with hairs which are angulate at their apices, the upper, outer margin with some long setae; base of digitus with only some minute setae; aedoeagus slender, angularly expanded apically (see figs. 14 and 27 in Dreisbach, 1949, also figs. 96

and 134 in Evans, 1951).

Distribution. — California, Colorado, and Kansas south to Oaxaca. See Evans, 1951, for marginal U. S. records. (Map 58.)

Mexican specimens examined. — 9 ♀♀, 1 ♂. BAJA CALIFORNIA: 1 ♂, Descanso, 1 Sept. 1955 (R. M. Bohart) [UCD]; 1 ♀, Mouth of Rio Santelmo, 21 Apr. 1941 (ESR & GEB) [CAS]. CHIHUAHUA: 1 ♀, 18 mi. W Jimenez, 10 Aug. 1951 (HEE) [MCZ]. JALISCO: 2 ♀♀, Guadalajara, 23-24 July 1951 (PDH, HEE) [CIS, MCZ]; 1 ♀, 8 mi. SW San Juan de los Lagos, 4 Aug. 1954 (R. F. Smith) [CIS]. MEXICO: 1 ♀, Valle de Bravo, 3 Aug. 1962, 6500 feet (HEE) [MCZ]. MORELOS: 1 ♀, 12 mi. E Cuernavaca, 4300 feet, 14 Aug. 1954 [KU]; 1 ♀, Tequesquitengo, 15 July 1961 (RRD) [MSU]. OAXACA: 1 ♀, Oaxaca, 8 July 1952 (EG & CM) [CIS].



***Anoplius (Pompilinus) splendens* (Dreischach)**

Pompilinus splendens Dreischach, 1949, Ent. Amer., (n.s.) 29: 20-21 [Type: ♂, KANSAS: Morton Co., 5 Aug. 1911 (FXW) (KU)].

Pompilinus pseudoreductus Dreischach, 1949, *ibid.*, pp. 21-23 [Type: MICHIGAN: Muskegon, 6 Aug. 1945 (RRD) (MCZ, no. 29, 327)]. Synonymy by Evans, 1951.

Pompilinus ohioensis Dreisbach, 1949, *ibid.*, pp. 24-25 [Type: OHIO: Pickaway Co., 21 June 1937 (RRD) (MCZ, no. 29, 326)]. Synonymy by Evans, 1951.

Anoplius (Pompilinus) splendens Evans, 1951, *Trans. Amer. Ent. Soc.*, 76: 320-322. — Evans, 1956, *Ann. Ent. Soc. Amer.*, 49: 117 (Mexican records).

Female. — Length 7.5-14.5 mm. Black, first two abdominal tergites (rarely only the second) orange-brown; pubescence often silvery on parts of the head and thorax, sometimes wholly dark. Propodeum not at all hairy. Clypeus about 2.5 X as wide as high, truncate below. MID .51-.56 X TFD; UID .80-.90 X LID; POL equal to or greater than OOL. Antennae slender, segment three at least as long as one and two together, equal to from .80 to 1.0 X UID; outer flagellar segments slender, all more than 3 X as long as thick. Tarsal comb short, as in the preceding two species. Slope of propodeum low and gradual, the declivity not strongly defined.

Male. — Length 6-11.5 mm. Black, with or without orange-brown coloration on some of basal abdominal segments; pubescence silvery over a considerable part of the head, thorax, and propodeum; propodeum without erect hairs. Clypeus about twice as broad as high; MID .54-.61 X TFD; UID subequal to or slightly less than LID; POL equal to or slightly greater than OOL. Third antennal segment 2.5-3.0 X as long as thick, about as long as fourth segment. Venter smooth, with only very short, scattered hairs. SGP rather broad, its median line strongly elevated, apically forming a small projection beyond the otherwise rounded margin of the plate. Genitalia with the parameres expanded and curved apically, the tip acute; digiti much as in the preceding species, but slightly broader and with the setae not so extensively angled at their apices (see figs. 30, 31, 53, 54 in Dreisbach, 1949; also figs. 103, 133 in Evans, 1951).

Distribution. — Florida, Texas, Durango, and Arizona to Idaho, Manitoba, Ontario, and Maine. Marginal U. S. records are given by Evans, 1951. (Map 58.)

Mexican specimens examined. — 2 ♀♀. CHIHUAHUA: 1 ♀, Carta Blanca, 16 mi. W Matachic, 8 July 1947 (WG) [AMNH]. DURANGO: 1 ♀, 8 mi. S Canutillo, 9 Aug. 1951 (PDH) [CIS].

Anoplius (Pompilinus) cylindricus (Cresson)

Pompilus cylindricus Cresson, 1867, *Trans. Amer. Ent. Soc.*, 1: 92 [Lectotype: ♂, TEXAS (ANSP, no. 553)].

Arachnophila brevihirta Banks, 1945, *Psyche*, 52: 105 [Type: ♀, ILLINOIS: Chicago, July (C. T. Brues) (MCZ, no. 26, 739)]. Synonymy by Evans, 1951.

- Pompilinus truncatus* Dreisbach, 1949, Ent. Amer., (n.s.) 29: 15-16 [Type: ♂, MICHIGAN: Gratiot Co., 2 Aug. 1947 (RRD) (MCZ, no. 29, 330)]. Synonymy by Evans, 1951.
- Pompilinus subtruncatus* Dreisbach, 1949, *ibid.*, p. 17-18 [Type: ♂, NEBRASKA: Lincoln, 14 June 1909 (C. H. Gable) (Univ. Nebraska; not seen by present writer)]. Synonymy by Evans, 1951.
- Pompilinus hispidus* Dreisbach, 1949, *ibid.*, pp. 23-24 [Type: ♂, MICHIGAN: Tuscola Co., 20 Aug. 1940 (RRD) (MCZ, no. 29, 323)]. Synonymy by Evans, 1951.
- Anoplius* (*Pompilinus*) *cylindricus* Evans, 1951, Trans. Amer. Ent. Soc., 76: 294-297. — Evans, 1956, Ann. Ent. Soc. Amer., 49: 174 (Mexico).
- Pompilinus clavipes* Dreisbach, 1958, Ent. News, 69: 61-62 [Type: ♂, TEXAS: Conlon, "8-7" 1952 (RRD) (MCZ, no. 30, 027)]. New synonym.

I have placed four of Dreisbach's names in the synonymy of *cylindricus* well aware that each is somewhat distinctive with respect to the terminalia of the type and several associated specimens. *Cylindricus* is a puzzling species and may well consist of two or more sibling species some or all of which tend to form local races in certain parts of the range. However, studies of a more sophisticated nature than have yet been conducted on this complex will be needed to resolve the difficulties. At present, it seems to me equally likely that a single variable species is involved. Study of the limited Mexican specimens available does nothing to clarify the matter; in fact, one is sorely tempted to add two more names for consideration, as Mexican specimens appear to fall into three lots, two of which are somewhat different from any described so far (see below, under "variation"). The following description is a generalized one, designed to cover the species in its broadest sense.

Female. — Length 4.5-12 mm. Black, abdomen orange-brown at least on the basal two tergites, sometimes over as much as five tergites and the basal three sternites; pubescence wholly dark or with some silvery pubescence on the lower front, clypeus, and base of mandibles. Body generally with more erect hair than is usual in this subgenus, the thoracic dorsum with scattered hairs, the femora sometimes short-haired, the propodeum varying from conspicuously hairy to (rarely) completely without erect hairs. Clypeus 2.5-2.7 X as wide as high, truncate below. Front broad, MID .56-.65 X TFD (usually over .60); UID .80-.90 X LID; ocelli in a rather broad triangle, POL usually distinctly greater than OOL. Antennae rather short, third segment shorter than one and two together, equal to from .50 to .84 X UID (usually between .60 and .70). Pronotum angulate or subangulate behind. Propodeum shorter and higher than in *splendens* and with the declivity more strongly defined. Front basitarsus

with three or (less commonly) four comb-spines, the spines distinctly longer than the width of the tarsal segments.

Male. — Length 3.5-12 mm. Black, the basal abdominal segments sometimes marked with orange; pubescence silvery at least on parts of the head, often over much of the body; propodeum often with some weak hairs on the sides. Clypeus 2.0-2.2 X as wide as high. MID .58-.64 X TFD; UID subequal to or slightly exceeding LID; POL usually slightly exceeding OOL. Third antennal segment 2.2-2.8 X as long as thick, often slightly shorter than fourth segment. Propodeum rather convex in profile, steeply declivous behind. Venter smooth, but SGP with the pubescence somewhat erect, with a variable number of short, erect or suberect setae medially and apically; median line of plate weakly to fairly strongly elevated, the apex obtusely or acutely angulate. Genitalia with the parameres with a rather strong sub-basal squama, apically much expanded, the apex acute; digiti clothed with short setae and with longer setae apically, the apex rather abruptly truncate; parapenial lobes slender and curved, aedoeagus simple, slightly expanded at the apex (see the various figures of Dreisbach and Evans, in the references cited above, for general features and variation).

Distribution. — North America except Arctic regions and along the Pacific coast; Ontario, Northwest Territories, and central Oregon to Arizona, Nayarit, Veracruz, and Florida. (Map 59.)

Mexican specimens examined. — 6 ♀ ♀, 7 ♂ ♂. CHIHUAHUA: 1 ♂, 8 mi. S Gallego, 5000 feet, 27 July 1953 [KU]; 1 ♂, Santa Clara, 2 July 1947 (WG) [AMNH]. NAYARIT: 2 ♂ ♂, 15 km. N Chapallilla, 19 July 1951 (HEE, PDH) [MCZ, CIS]. JALISCO: 1 ♂, El Tigre, 18 July 1954 (EIS) [CIS]; 1 ♂, Guadalajara, 5000 feet, 13 July 1959 (HEE) [MCZ]. MORELOS: 1 ♂, Cuernavaca, 5500 feet, 19 April 1959 (HEE) [MCZ]. VERACRUZ: 5 ♀ ♀, Veracruz, June, Aug., Sept., Nov. (HEE, RRD, RHP) [MCZ, MSU]; 1 ♀, Tecolutla, 4 Aug. 1962 (RHP) [MCZ].

Variation. — All seven males are entirely black, while the females have an unusually large amount of orange on the abdomen (three or four tergites and three sternites). The Chihuahua males are very similar to numerous Texas males before me and to the type specimen of *cylindricus*. The males from Nayarit, Jalisco, and Morelos are all rather small (5-7 mm.) and have terminalia very similar to one another and not exactly like those of any other males of this complex which I have studied. The subgenital plate is rather broad and tapers to an obtuse angle apically; the pubescence is suberect, especially along the slightly elevated midline, and on the sides toward the base



there is a prominent series of strong setae (not visible without dissection). The genitalia differ from the more typical form (Evans, 1951, fig. 91) in having only a few very weak setae on the inner margin of the parameres and in having the setae along the apical margin of the digiti unusually strong and curved.

The females from the state of Veracruz are distinctive because of the large amount of orange coloration in the abdomen, but some have only three tergites orange, as in many Texas and Florida specimens. They are more distinctive in lacking more than a small amount of erect hair on the propodeum; in fact in four of them there is scarcely any at all. Also, the front is unusually narrow (MID .56-.59 X TFD), the UID also narrow in relation to the third antennal segment (which measures .66-.84 X UID). The fact that no males are available from Veracruz and no females available from Morelos, Jalisco, and Nayarit makes it difficult if not impossible to handle these specimens other than to assign them to *cylindricus* in the broad sense. It would contribute nothing to our understanding of the complex to describe these specimens as one or two new species or subspecies at this time.

Anoplius (Pompilinus) fraternus (Banks)

Lophopompilus fraternus Banks, 1941, Canad. Ent., 73: 120 [Type: ♀, OKLAHOMA: Salt Plains, Cherokee, 14 June 1935 (C. T. Brues) (MCZ, no. 25, 264)].

Pompilinus dowi Dreisbach, 1949, Ent. Amer., (n.s.) 29: 12-14 [Type: ♂, FLORIDA: Coconut Grove, 22 May 1937 (R. Dow) (MCZ, no. 29, 322)]. Synonymy by Evans, 1951.

Anoplius (Pompilinus) fraternus Evans, 1951, Trans. Amer. Ent. Soc., 76: 322-325. — Evans, 1956, Ann. Ent. Soc. Amer., 49: 177 (Tamaulipas).

Female. — Length 7-14 mm. Black, T2 and usually T1 in greater part orange-brown; pubescence wholly dark. Body rather hairy for this subgenus; thoracic dorsum with numerous erect hairs, propodeum quite conspicuously hairy; coxae and sometimes the femora more or less hairy. Clypeus 2.7-2.9 X as wide as its median height, distinctly emarginate apically. Head rather wide, TFD 1.15-1.20 X VFD. MID .53-.60 X TFD; UID .75-.85 X LID; POL: OOL = 5:4 or 3:2. Third antennal segment longer than 1 and 2 together, measuring .75 to 1.2 X UID (usually .85-.95). Pronotum angulate behind; propodeum with the slope rather low, the declivity not strongly defined. Front basitarsus with four comb-spines, the spines about as long as the width of the tarsus.

Male. — Length 5.5-10 mm. Black, the abdomen marked with orange-brown near the base; pubescence silvery at least on the front and clypeus, often over much of the body. Propodeum often slightly hairy. Clypeus about twice as broad as high. MID .56-.63 X TFD; UID subequal to or slightly greater or less than LID; ocelli prominent, in about a right triangle, POL usually exceeding OOL. Third antennal segment about 3 X as long as thick, usually slightly longer than fourth segment. Abdomen slender, the venter smooth. SGP very slender, rather roughly setose. Genitalia unusual in that the parameres are relatively broad and straight and have a hyaline portion along the inner margin and apically; digiti spindle-shaped, somewhat twisted, wholly covered with short setae; parapenial lobes nearly straight, aedoeagus simple, slender (see figs. 104 and 137 in Evans, 1951).

Distribution. — This species is largely restricted to sea beaches along the Atlantic and Gulf of Mexico, from Long Island, N. Y., to Tamaulipas, and is often very common on protected beaches or bare, elevated parts of salt marshes. It is also locally common in certain inland localities (in Oklahoma, Kansas, Nebraska, Colorado), apparently always in areas of saline soil. It has not previously been reported from New Mexico, but I have before me a female taken 17 miles NE Roswell, 29 June 1956 (E. Ordway) [AMNH]. The only specimen I have seen from the Pacific coast (Gulf of California) is

the single female reported below from Sonora. If the species can become established in saline areas as far from the coast as Nebraska and New Mexico, there seems no reason why it should not have made the jump to the Gulf of California, but it is curious that it has not been collected more often there. (Map 58.)

Mexican specimens examined. — 1 ♀, 1 ♂. TAMAULIPAS: 1 ♂, La Pesca, 17 May 1952 (MC, WG) [AMNH]. SONORA: 1 ♀, Agiabampo, 29 April 1949 (G. M. Bradt) [AMNH].

Anoplius (Pompilinus) hispaniolae new species

Anoplius (Pompilinus) coruscus Evans, 1951, Trans. Amer. Ent. Soc., 76: 273 (not *coruscus* Smith, misidentification).

Allotype. — ♀, HAITI: Kenscoff, near Port-au-Prince, 4-6000 feet, 23 Sept. 1934 (P. J. Darlington, Jr.) [MCZ].

Description of female allotype. — Length 8 mm.; fore wing 6.7 mm. Black; T1-3 and all but the apical margin of T4, also S1-2, bright orange-brown; wings lightly infuscated, darker along the outer margin. Pubescence conspicuous silvery on the front, clypeus, base of mandibles, temples, scape, greater part of coxae and lower pleura, propodeum, and colored portions of abdomen, elsewhere brownish. Head, prothorax, and mesonotum with a few erect setae, but propodeum without setae; abdomen with the usual strong setae ventrally and apically, the last tergite with strong bristles. Clypeus 2.5 X as broad as high, truncate below. Head 1.16 X as wide as high, the vertex passing straight across between the eye tops. Front narrow, MID .54 X TFD; UID .82 X LID; POL:OOL = 5:4. First four antennal segments in a ratio of about 20:6:29:24, segment three equal to .94 X UID. Pronotum broadly angulate behind. Propodeum relatively short and strongly convex, with an oblique declivity on the posterior third; median line weakly impressed. Front basitarsus with three comb-spines, the spines approximately as long as the width of the tarsus at their bases. Fore wing with the basal and transverse median veins disjointed as usual in this subgenus; SMC3 subtriangular, narrowed by .8 above by the strong arcuation of the third intercubital vein.

Holotype. — ♂, HAITI: Port-au-Prince & vic., 6 Oct. 1934 (P. J. Darlington, Jr.) [MCZ, no. 30, 972].

Description of male holotype. — Length 7 mm.; fore wing 5 mm. Black; flagellum brownish beneath; abdomen bright orange-brown on the second and third segments, above and below, also on the apex of the first; wings very lightly infuscated, the fore wing broadly darker apically. Pubescence silvery over greater part of the body, especially dense and conspicuous on the front, temples,

pronotum, coxae, pleura, and propodeum; body with very limited erect hairs, the propodeum and abdominal venter quite smooth. Clypeus 2.3 X as wide as high, very weakly concave below. Head 1.08 X as wide as high, vertex forming a gentle arc above the eye tops. MID .60 X TFD; UID 1.12 X LID; POL:OOL = 9:7. First four antennal segments in a ratio of about 13:5:11:11, segment three about 2.4 X as long as thick. Pronotum angulate behind. SMC3 petiolate. SGP of moderate breadth, tapering to a sharp angle apically. Genitalia with the parameres much expanded apically, the tip acute, the subbasal squama strongly developed; digiti smoothly rounded apically, covered with short setae; parapenial lobes slender, curved; aedoeagus simple, slightly expanded apically.

Paratypes. — SANTO DOMINGO: 1 ♀, no further data [BMNH]. MONA ISLAND: 1 ♀, April 1935 [MCZ].

Variation. — The female paratypes are slightly larger than the allotype (both about 9 mm., fore wing 7.0-7.2 mm.). Both specimens have the abdomen entirely orange-brown except the apical two segments somewhat infuscated; in both these specimens SMC3 is petiolate. In both paratypes the third antennal segment is relatively somewhat shorter, subequal in length to the first two together, measuring .80-.82 X UID. In the Mona Island specimen the front is wider than in the other two, MID measuring .57 X TFD. These specimens otherwise agree rather closely with the allotype.

Remarks. — The female of this species bears a strong resemblance to *ambiguus* Dahlbom (= *coruscus* Smith), with which the species has been confused. The males lack the pale band on the pronotum and the setae on the venter found in *ambiguus*. The terminalia are distinctive, but both the SGP and genitalia show features in common with the widely distributed North American species *cylindricus*. It is interesting that the *cylindricus* females reported on an earlier page from the east coast of Mexico are especially like *hispaniolae*: the coloration is similar, the front narrower than usual in *cylindricus*, and the erect hair of the propodeum reduced.

Subgenus CAMERONOPLIUS new subgenus

Type species: *Pompilus (Aporus) decorus* Cameron, 1893.

Subgeneric characters. — Known species wholly black except males with a whitish stripe along posterior margin of pronotum; body moderately hairy, the propodeum with a few erect hairs which are whitish in the males. Clypeus truncate apically. Propodeum with a steep declivity posteriorly in both sexes.

Female without a tarsal comb, in fact with only about three small spines on the basitarsus other than apical ones, and with none but the apical spines on the second segment; legs otherwise quite spinose, the apical tarsal segments spined beneath in the female. Last segment of front tarsus of male slightly asymmetrical, weakly lobed in inner margin, the claw on this side strongly curved, its inner ray rounded; all other claws of male and all claws of female bifid, the inner ray truncate. Pulvillar pad and comb well developed, as usual in this genus. Fore wing with transverse median and basal veins interstitial; marginal cell removed from wing tip by slightly more than its own length; second intercubital vein missing, so that there are only two SMCs, the second large, receiving both recurrent veins; hind wing with anal vein meeting media at or slightly beyond origin of cubitus (fig. 20). Apical abdominal tergite of female with numerous strong bristles (15-20). Male venter smooth, without hair-tufts; SGP tectiform, rounded apically, without strong setae on the disc or margin; genitalia with the parameres straight, rather wide, tapering toward the apex, basal hooklets single.

Distribution. — Central Mexico. Known only from the type species.

Remarks. — Cameron's *decorus* is clearly an *Anoplius* in the broad sense, but it cannot be placed in *Anoplius sensu stricto* in spite of the lack of a tarsal comb in the female; the claws and the venation are unusual, the shape of the propodeum different, the parameres of the male genitalia quite unlike those of any true *Anoplius*. On the whole, *decorus* is more like an aberrant *Arachnophroctonus*, and I would expect it to have evolved from that subgenus independently of *Anoplius sensu stricto*.

Anoplius (Cameronoplius) *decorus* (Cameron) new combination

Pompilus (*Aporus*) *decorus* Cameron, 1893, Biol. Centr.-Amer., Hymen. II, p. 190 [Type: ♀, MEXICO: GUERRERO: Xucumanatlán, July, 7000 feet (HHS) (BMNH, no. 19, 751)].

Pompilus decorus Dalla Torre, 1897, Cat. Hymen., VIII, p. 284.

Description of type female. — Length 12 mm.; fore wing 9.4 mm. Black, pubescence strongly reflecting bluish over entire body and legs; wings moderately infuscated, fore wing with a darker outer marginal band. Erect setae abundant on temples and propleura, rather sparse on front, vertex, pronotum, and propodeum; front coxae setose but other coxae bare; abdominal sternites setose, especially toward the apex, apical tergite setose, some of the setae thick, bristly. Clypeus 2.2 X as broad as high, broadly truncate below. Head 1.12 X as wide as high; vertex nearly straight across between eye tops, actually very weakly convex behind ocellar triangle. Front narrow, MID .54 X TFD, .72 X

HE; UID .85 X LID. POL:OOL = 3:2, front angle of ocellar triangle about a right angle. First four antennal segments in a ratio of about 15:5:20:17, segment three .93 X UID. Pronotum short, subangulate behind. Postnotum transversely linear. Propodeum with the slope high, then abruptly declivous behind, the declivity weakly concave. Tarsal comb lacking and claws bifid, as described under subgeneric heading; wings as described under subgeneric heading and as shown in figure 20.

Plesiallotype. — ♂, MEXICO: MORELOS: 3 mi. N Alpuyecá, 3400 feet, 9 May 1959 (HEE) [MCZ].

Description of plesiallotype male. — Length 6 mm.; fore wing 5.6 mm. Black, posterior margin of pronotum with a pale yellow stripe, interrupted medially; wings subhyaline, with a darker outer marginal band. Pubescence dark and rather strongly reflecting bluish, except conspicuously silvery as follows: head, pronotum, coxae and much of pleura, sides of scutellum, metanotum, propodeum except sides, indistinct basal bands on first two tergites, and very conspicuous silvery pubescence on apical four tergites. Front with rather dense, light brown hairs; temples and propleura with dense whitish hair, propodeum with a few white hairs on each side. Clypeus twice as broad as high, truncate below. Head about 1.12 X as wide as high, the vertex arched gently above the eye tops. Inner orbits diverging above, UID 1.2 X LID; MID .65 X TFD; ocelli in a broad triangle, front angle greater than a right angle, POL very slightly exceeding OOL. First four antennal segments in a ratio of about 15:5:9:10, segment three 1.5 X as long as wide. Pronotum broadly angulate behind. Propodeum sloping weakly in front, rather steeply declivous on posterior fourth. Wings as in figure 20. Abdominal venter with a few scattered, suberect setae. SGP tectiform, bearing a few suberect setae medially. Genitalia (fig. 40) with the parameres widest about two-thirds the distance from the base, the squama large but not projecting; digiti slender, with a few weak setae, base of digiti also with a few setae; parapenials straight, slightly widened apically.

Distribution. — Known only from Guerrero, Morelos, and Puebla, and from a specimen taken at quarantine at Brownsville, Texas. (Map 59.)

Specimens examined. — 2 ♀♀, 4 ♂♂. GUERRERO: 1 ♀, Xucumanatlán, 7000 feet [type, BMNH]. MORELOS: 3 ♂♂, 3 mi. N Alpuyecá, 3400 feet, 3 April and 9 May 1959 (HEE) [MCZ, CU]. PUEBLA: 1 ♀, 3 mi. N Petlalcingo, 21 Aug. 1963 (FDP, LS) [UCD]. TEXAS: 1 ♂, Brownsville, in auto from Mexico, 7 March 1952 [USNM].

Variation. — The female from Puebla is much smaller than the type (7.5 mm., fore wing 6.5 mm.) and has a broader front (MID

.59 X TFD) and shorter antennae (third segment only .77 X UID). There is only a small amount of very fine, short hair on the propodeum and only a few strong bristles on the apical tergite. The Morelos males are very similar to one another in size, color of pubescence, and all structural details. The male taken at quarantine is considerably larger (9 mm., fore wing 7.5 mm.) and has less of the pubescence silvery, the propodeum having dark pubescence in front, also the vertex, parts of the pronotum, and most of the pleura having dark, bluish pubescence. The genitalia and other structural features are very similar to those of the plesiallotype; the head has been partially eaten by dermestids, so I have been unable to compare the standard head measurements.

Subgenus ANOPLIUS Dufour

Anoplius Dufour, 1934, Ann. Soc. Ent. France, 2: 483 [Type species: *Pompilus niger* Fabricius (= *nigerrimus* Scopoli); designated by Fox, 1901]. — Banks, 1912, Jour. N. Y. Ent. Soc., 19: 224. — Dreisbach, 1950, Amer. Midl. Nat., 43: 574-590. — Evans, 1951, Trans. Amer. Ent. Soc., 76: 325-357.

Pompilioides Radoszkowski, 1887, Horae Ent. Soc. Ross., 21: 94 [Type species: *Pompilioides unicolor* Radoszkowski; designated by Ashmead, 1902].

Aphiloctenus Ashmead, 1902, Canad. Ent., 34: 87 [Type species: *Pompilus virginiensis* Cresson, 1867; monobasic].

Subgeneric characters. — American species wholly black or blue-black; propodeum usually with erect hair; venter of male at least slightly hairy, often with dense brushes of hair. Clypeus truncate or very weakly emarginate. Propodeum with the slope rather low and even, especially in the male, in this sex without a distinct declivity. Female without a tarsal comb, the front basitarsus sometimes with strong spines but the second segment with only one or two minute spines on the outer side. Last segment of front tarsus of male slightly to rather strongly lobed on the inner margin. Transverse median vein of fore wing meeting the media beyond the origin of the basal; SMC3 narrowed above, rarely petiolate. Genitalia with the parameres slender in most species; digiti of variable shape; basal hooklets strong, single; aedoeagus fairly broad, somewhat bilobed apically.

Distribution. — Chiefly Holarctic, but with a few species entering the tropics of both the New World and the Old World.

Remarks. — Seven species of this subgenus occur in Mexico and Central America, all but two of them occurring also in the United States. Five of these species belong to the *illinoensis* species-group,

one of the most difficult complexes in this subfamily. Resolution of the Mexican members of this complex has necessitated reopening a number of problems relating to the U. S. species. In my treatment of the subgenus in 1951 I incorrectly placed *papago* in the synonymy of *tarsatus*; actually *papago* has proved to be a widespread species and something of a key to the understanding of the remainder of the complex. Also, *tarsatus* should be regarded as a full species rather than as a subspecies of *ventralis* and should be called by the earlier name *toluca* Cameron. It is now also apparent that *elongatus* Dreisbach, 1950, is a good species; I have seen specimens from three localities in Minnesota and Michigan, including one female, and feel that I was in error in placing this species in the synonymy of *ventralis*.

The following key to females includes only those species occurring in Mexico and Central America. However, the key to males includes all American species where the males are known; only the Mexican and Central American species are discussed in the text except for *dreisbachi*, a new species described from western United States. A few of the characters used perhaps require clarification. In the males, the term *squama* is used for the thick basal section of the paramere, which terminates in more or less of a knob bearing strong setae; beyond the squama the paramere is slender and often somewhat tapering. The front basitarsus of the female bears two rows of spines, the upper and lower rows (see Fig. 166 in my 1951 paper); in counting the spines in these rows, the spines at the apex of the segment are ignored. Similarly, when counting the spines in the median row beneath the hind basitarsus, the spines at the extreme apex of the segment are not counted.

Key to Species

Females

1. Claws bifid, the tooth sloping outward, the claws of each pair unequal, the inner claw much larger than the outer; stigma rather large *ithaca* (Banks)
- Claws normal, the tooth short and erect, the inner claws not larger than the outer claws 2
2. Ground color of body brilliant, deep Prussian blue; front and vertex narrow, the third antennal segment usually greater than UID *fulgidus* (Cresson)

- Ground color of body black, overlaid by a pubescence which is often bluish; third antennal segment often (but not always) shorter than UID 3
3. Eyes not or barely convergent above, i.e., UID is subequal to LID; a small species, up to 10 mm.; third antennal segment subequal to or slightly longer than first two together *imbellis* Banks
 Eyes distinctly convergent above, UID not more than .94 X LID; third antennal segment distinctly longer than first two together; length 8.5-14 mm 4
4. Front basitarsus weakly spined, the spines of the upper row minute, often visible with difficulty, those of the lower row fairly strong; third antennal segment equal to .90-1.15 X UID; slope of propodeum rather low and even *simulans* (Cresson)
 Front basitarsus more strongly spined, at least one spine in the upper row at least half as long as the width of the basitarsus; third antennal segment .80-1.03 X UID; slope of propodeum somewhat higher 5
5. Front barely wider than the two eyes taken together, MID .52-.55 X TFD, .72-.80 X eye height; vertex passing straight across between the eye tops *papago* Banks
 Front distinctly wider than the two eyes taken together, MID .55-.59 X TFD, generally more than .80 X eye height; vertex broader, forming a weak arc which extends very slightly above the tops of the eyes 6
6. Pubescence tending to be rather coarse, so as to form a strong bluish overlay to the black integument; longer spur of hind tibia .52-.63 X the length of the hind basitarsus (mean .58); spines in median row beneath hind basitarsus numbering 6 to 10 (mean 7.7); a widespread species *toluca* (Cameron)
 Pubescence somewhat more fine, although of similar color; longer spur of hind tibia .58-.67 X the length of the basitarsus (mean .62); spines in the median row beneath the hind basitarsus rather crowded, numbering from 9 to 14 (mean 11.5); known only from central Mexico *alticola* (Cameron)

Males²³

1. Venter without dense brushes of long, erect hairs, smooth or with brushes of short, less dense, semierect hairs; last segment of front tarsus only slightly produced on the inner margin (*nigerrimus* group) 2
 Venter with dense brushes of long, erect hair on some of the sternites; last segment of front tarsus variable 7

²³ This is a modification and expansion of the key I presented in 1951. The first six couplets are virtually the same, but beyond that there are many changes. The key includes all American species where the males are known. The males of the following four South American species are unknown: *perpilosus* Banks, *davisi* Banks, *minor* Banks, and *machachiensis* (Cameron).

2. Integument a brilliant deep Prussian blue; SGP very broad, the surface flat or somewhat folded medially, clothed, especially along the outer margin, with moderately long setae *fulgidus* (Cresson) 3
- Integument black; SGP not exactly as above 3
3. Stigma large, at least a third as long as the marginal cell; SGP very broad, folded roof-like beneath the tip of the abdomen; parameres unusually short *ithaca* (Banks) 4
- Stigma smaller, only a small fraction of the length of the marginal cell; SGP at most of moderate breadth; parameres longer 4
4. SGP moderately broad, strongly elevated medially; venter rather hirsute, but the setae showing little tendency to form brushes; parameres moderately broad 5
- SGP slender and acute apically; setae on sternites 3 to 5 fairly dense, tending to form weak brushes; parameres slender 6
5. Propodeum hairy; SMC3 wide above; digiti broad, subspatulate *depressipes* Banks
- Propodeum not or but slightly hairy; SMC3 triangular or nearly so, sometimes petiolate; digiti very slender *nigerrimus* (Scopoli)
6. SMC3 narrowed above but rarely triangular, never petiolate; SGP acutely pointed apically; parameres not much if any exceeding the other appendages of the genitalia *virginiensis* (Cresson)
- SMC3 triangular, usually petiolate; SGP extremely slender and attenuate apically; parameres very strong, much exceeding the other appendages *hispidulus* Dreisbach
7. Last segment of front tarsus weakly modified, widest near its apex; SGP with nearly parallel sides and with the apex rather evenly rounded, not strongly elevated medially (fig. 79); digiti with some setae on the upper, inner margin which are directed strongly upward (fig. 45) (*simulans* group) 8
- Last segment of front tarsus strongly lobed in the margin, this segment widest about half the distance from base to apex; terminalia variable, rarely exactly as above (*illinoensis* group) 9
8. Pubescence silvery only on the head and to a limited extent on the posterior rim of the propodeum; digiti extremely slender and attenuate apically (Brazil) *angustus* Banks
- Pubescence silvery over much of the thoracic pleura, coxae, and posterior half of the propodeum; digiti much less attenuate apically (figs. 45, 46) (Mexico to Panama) *simulans* (Cresson)
9. Coxae (in most specimens) in part silvery-pubescent; digiti extremely slender, only slightly wider on the apical part than at the basal stem; SGP very slender (species of northern distribution) 10
- Coxae without silvery pubescence; digiti somewhat spindle-shaped, the apical portion always considerably wider than the basal stem 11

10. Propodeum not or barely hairy; SMC3 small, triangular or petiolate; parameres small (known only from Minnesota and Michigan) *elongatus* Dreisbach
 Propodeum with at least a few dark, erect hairs; third submarginal cell larger, occasionally triangular; parameres large, quite long and rather wide near the base (Holarctic)
 .. *tenuicornis* (Tournier) (= *piliventris* Morawitz, *basalis* Dreisbach) ²⁴
11. Ventral hair-brushes, as seen from the side, strongly discontinuous, as the brush on S4 is absent from a wide posterior area of that sternite and is thus well separated from that on S5; pubescence strongly bluish; genitalia as in figure 50 *toluca* (Cameron)
 Ventral hair-brushes, as seen from the side, continuous along S4 and 5 or very narrowly separated, the brush on S4 absent from only a very narrow posterior margin of that sternite 12
12. Hair brush on S5 discontinuous across the sternite, i.e., separated into two lateral tufts; inner margin of digiti with a strip which is devoid of setae *ventralis* (Banks)
 Hair brush on S5 continuous across the sternite although the hairs are shorter medially; digiti without a bare strip along the inner margin 13
13. SGP but weakly elevated medially, the sides tapering gradually to a narrowly rounded apex, the outer margin fringed with an even row of stout bristles; a small species, 5-9 mm. *imbellis* Banks
 SGP more elevated medially, the apical portion somewhat bushy-haired, not margined with an even row of stout bristles 14
14. S3 with a strong brush of hairs, nearly as strong as that on S4; genitalia and subgenital plate approximately as shown in figures 47 and 81 15
 S3 with at most a moderate number of oblique hairs, not forming a brush nearly as strong as that on S4; genitalia not wholly as above 16
15. Pubescence weakly to moderately bluish, silvery on the sides of the lower front (except in most eastern U. S. specimens); setae on digiti in considerable part strongly bent (fig. 47) *papago* Banks
 Pubescence wholly intensely bluish, not silvery on the front; setae on digiti straight (Colombia, Ecuador)
 *ambatoensis* (Cameron) (= *bolivari* Banks, = *williamsi* Banks)
16. Scape and propodeum not or only very slightly hairy; S3 also weakly if at all hairy; inner margin of digitus with a strong group of setae which are directed mesad *illinoensis* (Robertson)
 Scape and propodeum prominently hairy; S3 with a number of fairly strong setae, forming a weak brush; inner margin of digitus with relatively few setae which are strongly directed mesad 17

²⁴ Since European workers now seem agreed that *piliventris* should be regarded as a synonym of *tenuicornis*, North American workers may as well follow suit (see Wolf, 1963, *Opuscula Ent.*, 28: 138).

17. Pubescence wholly dark; SGP relatively narrow (fig. 80); inner margin of digitus rather convex on outer part, the digiti clothed with short, stiff setae (fig. 48) (Mexico) *alticola* (Cameron)
 Pubescence silvery on sides of lower front; SGP with rather wide, weakly pigmented side-pieces (as in fig. 81); digiti more spindle-shaped, with somewhat longer setae (fig. 49) (western U. S.) *dreisbachi* n. sp.

Males of the *illinoensis* complex may be grouped as follows with reference to the shape of the digiti of the genitalia:

Digiti extremely slender: *piliventris*, *elongatus*

Digiti narrowly spindle-shaped, their inner margin gently concave: *toluca*, *ventralis*, *dreisbachi*

Digiti broader, their inner margin convex just below the apex: *alticola*, *papago*, *ambatoensis*, *imbellis*, *illinoensis*

Anoplius (*Anoplius*) *ithaca* (Banks)

Psammochares ithaca Banks, 1912, Jour. N. Y. Ent. Soc., 19: 224 [Type: ♀, NEW YORK: Ithaca, 1-7 July (MCZ, no. 13, 699)].

Anoplius selkirkensis Banks, 1919, Bull. Mus. Comp. Zool., 63: 234 [Type: ♀, BRITISH COLUMBIA: Selkirk Mts., 14 Aug. 1905 (J. C. Bradley) (CU, no. 685)]. Synonymy by Evans, 1951.

Anoplius (*Anoplius*) *ithaca* Evans, 1951, Trans. Amer. Ent. Soc., 76: 336-339.

Female. — Length 5.5-11 mm. Black; wings subhyaline basally, becoming rather heavily clouded toward the apex; body with a rather variable amount of silvery pubescence, usually silvery at least on the front, hind coxae, and posterior part of the propodeum. Body, including the propodeum, with moderately abundant erect hair. Clypeus about 3 X as broad as high; MID .56-.62 X TFD; eyes distinctly convergent above, UID .85-.90 X LID; vertex nearly straight across. Antennae elongate, third segment much longer than first two together, equal to from .70 to 1.0 X UID. Legs rather strongly spinose. Claws of each pair asymmetrical, the inner claw being larger than the outer and virtually as long as the last tarsal segment; inner ray of claws subparallel to outer ray but much shorter. Stigma very large; SMC3 wide above.

Male. — Length 4.5-9 mm. Black; wings hyaline or nearly so, fore wing darkened apically; head and thorax usually extensively silvery-pubescent. Body moderately hairy, the propodeum usually somewhat hairy, but the venter with only sparse, suberect setae. Clypeus 2.6-3.0 X as wide as high; MID .61-.66 X TFD; eyes diverging slightly if at all above. Last segment of front tarsus less than twice as long as its maximum width; claws of each pair only slightly unequal. SGP very wide, strongly folded along the median line so as to form a roof-like surface beneath the genitalia. Genitalia with the parameres unusually short, only about half the length of the other appendages; digiti angled midway,

long and tapering beyond the angulation; parapenial lobes slender, nearly as long as the aedeagus (see figs. 15 and 16 in Dreisbach, 1950; also fig. 107 in Evans, 1951).

Distribution. — Throughout most of North America, but confined to the shores of streams and other bodies of water, especially where there are stones. The known range extends from the Yukon to Maine, south to Georgia, northern Mexico, and California. (Map 59.)

Mexican specimens examined. — 2 ♀♀. NUEVO LEON: 1 ♀, 6 mi. S Monterrey, 12 Aug. 1959 (AM & LS) [UCD]; 1 ♀, General Teran, 19 July 1954 (RRD) [MSU].

Anoplius (Anoplius) fulgidus (Cresson)

Pompilus fulgidus Cresson, 1865, Proc. Ent. Soc. Phila., 4: 131 [Type: ♀, CUBA (ANSP, no. 562)]. — Cresson, 1869, Proc. Boston Acad. Nat. Hist., 12: 367 (Orizaba, Mexico). — Cameron, 1893, Biol. Centr.-Amer., Hymen. II, p. 199. — Fox, 1895, Proc. Calif. Acad. Sci., (2) 5: 265 (Baja Calif.).

Pompilus aeneopurpureus Fox, 1891, Trans. Amer. Ent. Soc., 18: 339 [Type: ♀, JAMAICA: Portland (ANSP, no. 561)]. Synonymy by Evans, 1951.

Pompilus championi Cameron, 1893, Biol. Centr.-Amer., Hymen. II, p. 196 [Type: ♀, GUATEMALA: Guatemala City, 5000 feet (GCC) (BMNH, no. 19, 686)]. New synonym (see remarks below).

Pompilus mundulus Fox, 1897, Proc. Acad. Nat. Sci. Phila., 49: 243-244 [Type: ♀, BRAZIL: Chapada, December (CM)]. New synonym.

Anoplius mundulus Banks, 1947, Bull. Mus. Comp. Zool., 99: 415 (Brazil, Ecuador).

Anoplius amarus Banks, 1947, *ibid.*, pp. 416-417 [Type: ♀, PERU: Puerto Pichis, 12-19 July (CU, no. 2533); paratypes from Blairmont, British Guiana (MCZ)]. New synonym.

Anoplius aenopurpureus [sic] Dreisbach, 1950, Amer. Midl. Nat., 43: 582.

Anoplius (Anoplius) fulgidus Evans, 1951, Trans. Amer. Ent. Soc., 76: 339-341.

This widely distributed, rather variable Neotropical species has been described no less than five times. The type of *championi* Cameron is actually a "humbug", as the head of the type of *imperialis* Cameron is glued to the thorax and abdomen of the type of *championi* (and vice versa). In each case I consider Cameron's name to apply to the species making up the major part of the specimen, through which the specimen is pinned.

Female. — Length 7.5-14 mm. Integument deep Prussian blue, overlaid by a fine pubescence which varies from bluish to cinereous, often silvery on the front, base of the mandibles, and hind coxae; wings moderately to heavily infuscated, reflecting metallic colors. Body moderately hairy, the propodeum with numerous strong, dark setae. Clypeus 2.2-2.5 X as wide as high, apical margin rounded laterally, truncate or weakly concave medially. Front narrow, MID .52-.55 X TFD; UID .80-.90 X LID; ocelli in a compact triangle, the front angle less than a right angle, POL:OOL = 3:4. Antennae slender, third segment much longer than first two together and equal to .95-1.25 X UID. Front basitarsus weakly spined, the spines in the upper row minute, bristle-like, sometimes barely visible. SMC3 narrowed by .5-.9 above.

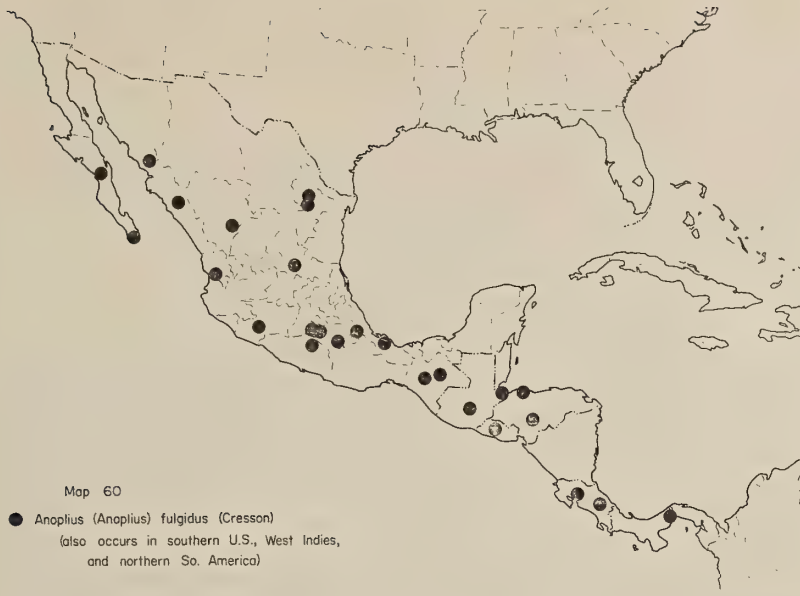
Male. — Length 6-10 mm. Color of integument and pubescence as in female, the pubescence always silvery on the lower front, clypeus, and base of mandibles, often also on the coxae, propodeum, and elsewhere; fore wings moderately infuscated, darker apically, reflecting metallic colors; hind wings subhyaline, darker apically. Propodeum with numerous dark erect hairs; venter with moderately abundant short, suberect setae, not long or dense enough to form brushes. Clypeus about twice as broad as high; front relatively narrow; UID subequal to or slightly greater than LID; ocelli as in female. Last segment of front tarsus about twice as long as its greatest width. SMC3 strongly narrowed above, usually subtriangular. SGP broad, the surface covered with short, erect setae and the margin fringed with somewhat longer setae, the median line barely to fairly strongly elevated. Genitalia with the parameres nearly or quite as long as the parapenial lobes; digiti slender, directed mesad apically, covered with setae of moderate length; base of digitus with several short setae; basal hooklets single, but each somewhat doubled at its tip (fig. 44; see further remarks below, under "variation").

Distribution. — Peru and Brazil north through the Antilles and Central America to Florida, Texas, Utah, and California. For U. S. records see Evans, 1951, for South American records Banks, 1947, under *mundulus* and *amarus*. I have seen specimens from all the major islands of the Greater Antilles, also from St. Thomas in the Virgin Islands. (Map 60.)

Mexican and Central American specimens examined. — 26 ♀♀, 30 ♂♂. BAJA CALIFORNIA: 1 ♀, San José del Cabo [CAS]; 1 ♂, Las Parras, Oct. 1923 (W. M. Mann) [USNM]. SONORA: 1 ♂, Aduana, 15 Mch. 1962 (LS) [UCD]. SINALOA: 1 ♂, 13 mi. N Culiacan, 17 Mch. 1962 (FDP) [UCD]. DURANGO: 1 ♀, Nombre de Dios, 25 June 1952 (EG) [CIS]. NUEVO LEON: 1 ♀, Canyon de Voca, Monterrey, 12 Aug. 1953 [ENAC]; 1 ♀, 4 mi. W El Cercado, 6 June 1951 (HEE) [MCZ]. SAN LUIS POTOSI (recorded by

Evans, 1951). PUEBLA: 2 ♂♂, 3 mi. NW Petlalcingo, 3 Apr. 1962 (LS) [UCD]. MORELOS: 2 ♀♀, Cuernavaca, April, June 1959, 5500 feet (HEE) [MCZ, CU]; 2 ♂♂, 5 mi. E Cuernavaca, Mch. May 1962 (LS, FDP) [UCD]; 1 ♂, 6 mi. S Temixco, 30 Mch. 1962 (LS) [UCD]; 2 ♀♀, 9 ♂♂, 3 mi. N Alpuyeca, Mch.-May 1959, 3400 feet (HEE) [MCZ, CU]. MICHOACAN: 1 ♀, 7 mi. S Tumbis-
catio, 1 Dec. 1950 (RFS) [AMNH]. NAYARIT: 1 ♀, Compostela, 14 Feb. 1934 [MCZ]. GUERRERO: 2 ♀♀, 2 ♂♂, Xalitla, 20 Mch. 1959, 1500 feet (HEE) [CU, MCZ]. VERACRUZ: 4 ♀♀, 1 ♂, 14 mi. SE San Andres Tuxtla, 1600 feet, 24 June 1961 (G. Byers) [KU]; 1 ♀, 1 ♂, Orizaba, Feb., Aug. (RRD) [MSU]. CHIAPAS: 2 ♂♂, nr. Ocosingo, 9 Mch. 1953 (RCB & EIS) [CIS]; 1 ♀, Tuxtla Gutierrez, 27 Sept. 1961 (FPM) [ENAC]. GUATEMALA: 3 ♂♂, Concepcion, 1400 feet (C. N. Ainslie) [USNM]; 1 ♂, Livingston, 18 Feb. 1905 (C. C. Deam) [USNM]; 1 ♀, Guatemala City, 5000 feet (GCC) [BMNH]. HONDURAS: 1 ♀, Puerto Cortez, 26 Apr. 1917 (F. J. Dyer) [USNM]; 1 ♀, Tegucigalpa, 6 July 1917 [USNM]. EL SALVADOR: 1 ♀, "S. Tech A", 18 Dec. 1953 (M. Salazar) [USNM]; 1 ♀, Los Chorros Nat. Pk., 16 July 1961 (M. Irwin) [UCD]. COSTA RICA: 1 ♀, Turrialba, 20 May 1951 (O. L. Cartwright) [USNM]; 1 ♂, 12 mi. SW Cañas, Guanacaste Prov., 27 Feb. 1964 (HEE) [MCZ]. PANAMA: 1 ♀, Rio Corona, 2000 feet, 3 May 1952 (CWR) [KU]; 1 ♀, 1 ♂, La Chorrera, 12 Apr. 1912 (A. Busck) [USNM].

Variation. — Females are reasonably similar in appearance throughout northern South America and north through Central America to Texas and California. Females from the Antilles and Florida average smaller in size and are more intensely blue (especially noticeable on the legs); they also have the third antennal segment not much if any greater than UID. The males show a disconcerting amount of variation in the terminalia. The SGP is almost perfectly flat in most continental and some Cuban specimens, but some Cuban and all other West Indian males I have seen have the median line distinctly elevated, especially basally; these males also tend to have the erect setae on the plate somewhat longer (several Morelos males are also of this type). In specimens from Mexico and Texas the digitus is typically very slender and bears strong setae which are often in part longer than the width of the digitus (fig. 44). Specimens



from the Antilles other than Cuba tend to have shorter parameres and the digitus less strongly curved and more acute apically (see fig. 7 in Dreisbach, 1950), while in some Cuban and Florida specimens the parameres are broader and have much shorter setae (as in fig. 109 in Evans, 1951). Clearly this matter will repay further study. It may be found desirable to resurrect some of the names placed in synonymy above as subspecific names or as names of sibling species.

Anoplius (Anoplius) imbellis Banks

Anoplius imbellis Banks, 1944, Bull. Mus. Comp. Zool., 94: 169 [Type: ♀, OREGON: Corvallis (HAS) (CAS, no. 5954)]. — Dreisbach, 1950, Amer. Midl. Nat., 43: 583, 590.

Anoplius imbellis var. *major* Dreisbach, 1950, *ibid.*, pp. 581-582 [Type: ♂, VIRGINIA: Falls Church, 29 June (NB) (MCZ, no. 28, 389)]. Synonymy by Evans, 1951.

Anoplius (Anoplius) imbellis Evans, 1951, Trans. Amer. Ent. Soc., 76: 348-350. — Evans, 1956, Ent. News, 67: 8-9.

Anoplius subimbellis Dreisbach, 1952, Amer. Midl. Nat., 48: 155-156 [Type: ♂, VIRGINIA: Falls Church, 11 July (NB) (MCZ, no. 29, 331)]. Synonymy by Evans, 1956.

Female. — Length 5-10 mm. Black; wings lightly to moderately infuscated, darker along outer margin; pubescence dark, usually slightly bluish or violaceous, sometimes silvery on sides of lower front. Body moderately hairy, the propodeum always with some rather long, black hairs. Clypeus 2.3-2.5 X as broad as high, truncate below. MID .53-.61 X TFD; eyes converging very little if at all above, UID .90-1.05 X LID (usually about .97); POL usually slightly less than OOL. Third antennal segment subequal to or slightly longer than first two together, equal to from .65 to .85 X UID. Front basitarsus with two spines in the upper row, these spines thick but not more than half as long as the width of the tarsus; lower row with one of the spines nearly as long as the width of the tarsus. SMC3 narrowed by at least half above, often subtriangular, the third intercubital vein strongly arched.

Male. — Length 5-9 mm. Black; wings subhyaline or lightly infuscated, dark apically; pubescence sometimes wholly dark, more often silvery, cinereous, or light brown on parts of the head, pleura, and leg-bases; propodeum with a few erect hairs; venter with some strong setae on S3 and with strong brushes of hair on S4 and 5, these brushes continuous as seen in lateral view, also continuous across the sternites, although much shorter medially than laterally. Clypeus 2.2-2.5 X as wide as high; MID .57-.61 X TFD; UID 1.0-1.12 X LID; POL usually slightly less than OOL. Antennae slender, third segment 2.5-3.0 X as long as thick, subequal to or slightly greater or less than fourth segment. Last segment of front tarsus strongly lobed on inner margin. Abdomen with prominent ventral hair-brushes, as described above. SGP rather weakly elevated medially, tapering evenly to a narrowly rounded apex, the margin beset with an even row of thick bristles. Genitalia with the parameres generally slightly shorter than the digiti, with a strong squama bearing large bristles; digiti angled somewhat mesad apically, the tip acute or subacute, the surface covered with short or moderately long setae (see fig. 112 in Evans, 1951, also fig. 24 in Dreisbach, 1950, and fig. 23 in Dreisbach 1952).

Distribution. — This species has a remarkably wide range, occurring from Alaska and Northwest Territories to North Carolina and, at moderate to high elevations, to Costa Rica. Marginal records from north of Mexico were presented by Evans, 1951. (Map 61.)

Mexican and Central American specimens examined. — 17 ♀♀, 55 ♂♂. NUEVO LEON: 1 ♀, Galeana, 5-6000 feet, 2 Aug. 1939 (R. Haag) [MCZ]. SONORA: 1 ♀, Campo Utah, 20 Aug. 1953 (B. Malkin) [CAS]; 1 ♂, 8 mi. S Peon, 295 mi. S Nogales, 15 Nov. 1955 (E. Bay) [CU]. BAJA CALIFORNIA: 1 ♀, 3 ♂♂, Descanso, Sept. 1955 (RMB) [UCD]; 1 ♂, Sierra San Pedro Martir, 6500 feet, 29 May 1958 (W. Patterson) [CIS]. GUANAJUATO: 1 ♂, Yuriria, 6500 feet, 7 Aug. 1962 (HEE) [MCZ]. MEXICO: 1 ♀, 22 ♂♂, 34 km. W Toluca, 8500 feet, 9 Aug. 1962 (HEE) [MCZ, ENAC, USNM];



5 ♂♂, Valle de Bravo, 6500 feet, 3 Aug. 1962 (HEE) [MCZ]. MORELOS: 1 ♀, Tepoztlan, 20 Aug. 1956 (RRD) [MSU]; 1 ♂, Lagunas de Zempoala, 9200 feet, 11 Aug. 1962 (HEE) [MCZ]; 6 ♀♀, 14 ♂♂, Cuernavaca & vic., Mch.-May (HEE, FDP, LS) [CU, MCZ, UCD]; 2 ♂♂, Las Estacas, 3000 feet, 6 April 1959 (HEE) [CU, MCZ]. PUEBLA: 1 ♀, 1 ♂, 5 mi. NE Teziutlan, 4700 feet, 27 June 1953 [KU]; 1 ♂, Puebla, 3 July 1952 (EG & CM) [CIS]. VERACRUZ: 1 ♂, Jalapa, 28 Sept. 1961 (RRD) [MSU]. CHIAPAS: 3 ♀♀, San Cristobal las Casas, 26 April-1 May 1959, 7500 feet (HEE) [CU, MCZ]. GUATEMALA: 2 ♀♀, Lake Atitlan, 6000 feet, 27 Feb. 1932 (C. N. Ainslie) [USNM]. COSTA RICA: 2 ♂♂, Corralillo Irazu, Jan.-Feb. 1924 (F. Tristan) [ANSP].

Variation. — This species shows no noteworthy geographic variation except that females from Chiapas and Guatemala have the pubescence rather strongly bluish, almost as intense as in *toluca*. One notes some slight variation in the length of the parameres, the length of the setae on the digiti, and the degree to which the tips of the digiti are drawn out into a point, but this variation appears to bear no strong correlation with geography. A partial appreciation of this variation can be obtained by comparing the figures cited above.

Anoplius (Anoplius) simulans (Cresson)

Pompilus simulans Cresson, 1869, Proc. Boston Soc. Nat. Hist., 12: 367 [Type: ♂, MEXICO: VERACRUZ: Orizaba (F. Sumichrast) (ANSP, no. 557)].
— Cameron, 1893, Biol. Centr.-Amer., Hymen. II, p. 200.

Pompilus interstitialis Cameron, 1893, Biol. Centr.-Amer., Hymen. II, pp. 195-196 [Type: ♀, PANAMA: Volcan de Chiriqui, 2-3000 feet (GCC) (BMNH, no. 19, 691)]. New synonym.

Anoplius simulans Bradley, 1944, Notulae Naturae, Acad. Nat. Sci. Phila., no. 145, p. 9. — Dreisbach, 1950, Amer. Midl. Nat., 43: 586.

Description of type female of interstitialis. — Length 12 mm.; fore wing 10 mm. Black; pubescence wholly dark, with moderate bluish reflections over the entire body; wings moderately infuscated, somewhat violaceous. Erect setae present on clypeus, front, vertex, temples, propleura, front coxae, pronotum, and in some abundance on the mesopleura and propodeum; mesonotum, middle and hind coxae, and femora weakly setose; T1 with short hairs basally, the other tergites weakly setose except the apical one strongly bristly; venter prominently setose. Clypeus 2.2 X as wide as high, truncate below. Front narrow, MID .52 X TFD, 1.10 X LID; UID .81 X LID. POL:OOL = 3:4. First three antennal segments in a ratio of about 14:5:23, segment three equal to 1.10 X UID. Vertex passing straight across between eye tops. Pronotum sharply angulate behind. Slope of propodeum low and even, median line barely impressed. Front basitarsus weakly spinose, the spines of the upper row minute, visible with difficulty, two of the three spines of the lower row approximately as long as the width of the basitarsus. Fore wing with the basal vein arising slightly basad of the transverse median vein; marginal cell removed from wing tip by about its own length; SMC3 slightly wider below than second but more strongly narrowed above because of the strong arcuation of the third intercubital vein.

Description of a paratype male of simulans. — Length 8 mm.; fore wing 7 mm. Black; wings subhyaline, slightly darker along the outer margin. Pubescence conspicuously silvery on the sides of the lower front and clypeus, base of the mandibles, temples, coxae, a major portion of the pronotum and mesopleura, posterior half of the propodeum, and base of the first abdominal segment; pubescence elsewhere brownish, obscurely violaceous. Head and propleura densely hairy; coxae and thoracic dorsum and pleura more hairy than usual in this subgenus; propodeum with many erect hairs; venter rather hairy, the hairs on S4 and 5 long and dense, forming brushes which are continuous in both lateral and ventral aspects, S3 with only a few long setae. Head about 1.17 X as wide as high, vertex forming a gentle arc above the eye tops. Clypeus 2.2 X as wide as high, truncate below. Front of moderate width, MID .63 X TFD; UID and LID subequal. Ocelli in a compact triangle, OOL about twice POL. First four antennal segments in a ratio of about 5:2:5:5, segment three about 2.5 X as long as thick. Pronotum sharply angulate behind. Slope of propodeum rather low and even, median line distinctly impressed. Last segment of front tarsus rather weakly produced on the inner margin, this segment

widest about two-thirds the distance from the base. Longer spur of hind tibia .9 the length of the basitarsus. Marginal cell removed from wing tip by about its own length; SMC3 narrowed by .8 above. SGP slender, its sides approaching very gradually to a narrow, subtruncate apex (fig. 79). Genitalia with the parameres elongate, nearly as long as the parapenials; digiti spindle-shaped, tapering to an acute apex, covered with slightly curved, mostly upward-directed setae; base of digitus with one strong seta (fig. 46).

Distribution. — Central Mexico to Panama, chiefly at moderate or fairly high elevations. (Map 57.)

Specimens examined. — 14 ♀♀, 16 ♂♂. SAN LUIS POTOSI: 1 ♀, 5 mi. W Xilitla, 22 July 1954, 2400 feet (KU Mex. Exped.) [KU]. VERACRUZ: 4 ♂♂, Orizaba (F. Sumichrast) [type series, ANSP]; 1 ♀, 2 ♂♂, Orizaba, 12-22 Aug. 1961 (RRD) [MSU]; 1 ♀, Coscomatepec, 27 Apr. 1962 (FDP) [UCD]. MORELOS: 2 ♂♂, Cuernavaca, 5500 feet, 1 March, 9 July (HEE, RRD) [MCZ, MSU]; 1 ♂, 5 mi. E Cuernavaca, 22 Mch. 1962 (LS) [UCD]. CHIAPAS: 1 ♂, 20 mi. W San Cristobal las Casas, 6000 feet, 3 May 1959 (HEE) [MCZ]; 2 ♀♀, 1 ♂, Ixtapa, 11 Apr. 1962 (FDP) [UCD]. COSTA RICA: 1 ♂, Mt. Redondo, 1902 [ANSP]; 1 ♀, LaLola, 19 July 1963 (HAS) [OSU]; 1 ♂, Monteverde, 1400 meters, 1 Feb. 1963 (CWR) [KSU]; 5 ♀♀, 3 ♂♂, 6 mi. W Turrialba, 14-23 July 1963 (HAS) [OSU]. PANAMA: 3 ♀♀, Volcan de Chiriqui, 2000-6000 feet, (two GCC, one without name of collector) [BMNH, CU].

Variation. — The female from Volcan de Chiriqui listed in the Biologia Centrali-Americana as *omitemensis* Cameron is slightly smaller than the type of *interstitialis* (9.5 mm., fore wing 8.5 mm.) but very similar in most respects. The front is slightly broader, MID measuring .55 X TFD, and the third antennal segment is subequal to UID. The Mexican females are 8-10 mm. long. In these specimens MID varies from .50 to .55 X TFD, UID from .90 to 1.15 X UID.

The available males range in size from 6 to 8.5 mm. and are very similar in pubescence, pilosity, wing venation, and most structural details. POL:OOL varies from 1:2 to 3:4. In several males, the brushes of hair on the venter are less strong than described above, especially on the fifth sternite; the hairs are long, but not especially dense. The Costa Rica, Morelos, and Chiapas males have terminalia very similar to those of the type series except that the digiti are slightly less attenuate apically and have slightly shorter, sparser, and straighter

hairs; the digiti of a Morelos specimen are shown in fig. 45. Dreisbach (1950, fig. 8) has presented a photograph of the genitalia of a paratype other than the one described above, but having virtually identical genitalia.

Anoplius (*Anoplius*) *alticola* (Cameron) new combination

Pompilus alticola Cameron, 1893, Biol. Centr.-Amer., Hymen. II, p. 194 [Type: ♀, MEXICO: GUERRERO: Xucumanatlán, 7000 feet, July (HHS) (BMNH, no. 19, 692)].

Pompilus alticolus Dalla Torre, 1897, Cat. Hymen., VIII, p. 272.

This species has remained unknown since its description 60 years ago. Cameron's type is in good condition, and his allotype male, although lacking the head, is undoubtedly correctly associated with the female. This is unquestionably a good species, although separable with some difficulties from its relatives. The species appears to occupy a somewhat limited range in the Mexican highlands.

Description of type female. — Length 12 mm.; fore wing 9 mm. Black; pubescence very fine, with moderately strong bluish reflections; wings fuscous, violaceous. Erect setae present on clypeus, front, vertex, temples, and prothorax, including front coxae; mesopleura with only scattered short setae; propodeum with numerous fairly long setae; abdomen with strong setae ventrally, the last tergite with strong bristles. Clypeus 2.5 X as wide as high, the margin weakly concave. Head 1.10 X as wide as high, the vertex elevated in a weak arc very slightly above the eye tops. Front of moderate width, MID .59 X TFD, 1.17 X LID, .85 X HE; UID .87 X LID. POL:OOL = 6:7. First four antennal segments in a ratio of about 13:4:19:17, segment three .83 X UID. Pronotum angulate behind. Propodeum with a slightly higher slope and more distinct declivity than in *simulans*. Front tarsus fairly strongly spined, the basitarsus with two strong spines in the upper row (about as long as width of tarsus) and two somewhat stronger spines in the lower row. Longer spur of hind tibia .67 X the length of the basitarsus. Fore wing with the basal vein arising well basad of the transverse median vein; marginal cell removed from wing tip by 1.2 X its own length; SMC3 slightly wider below than second, but more strongly narrowed above by the strong arcuation of the third intercubital vein.

Male. — Length 8-10.5 mm.; fore wing 7-9 mm. Black; pubescence wholly dark, with moderately strong bluish reflections; wings moderately infuscated, violaceous, slightly darker along outer margin. Head and prothorax with rather numerous erect setae; propodeum with a number of prominent setae on each side; S3 with a number of rather long setae near the posterior margin which slope backward strongly; S4 and 5 with dense brushes of hairs, continuous in

lateral view and also across the sternites, although much shorter medially than laterally. Clypeus about 2.1-2.3 X as broad as high, truncate below. Head slightly wider than high, vertex forming a gentle arc slightly above eye tops. Front of moderately breadth, MID .57-.61 X TFD; UID and LID subequal. POL:OOL=about 4:5. Third antennal segment nearly 3 X as long as wide, slightly longer than fourth segment. Slope of propodeum considerably higher than in *simulans*; last segment of front tarsus much more strongly lobed than in that species, the segment widest about midway. Longer spur of hind tibia .75 X length of basitarsus. Fore wing as described for female; SMC3 usually nearly triangular. Venter with prominent brushes of hair as described above; SGP relatively slender, tapering to a narrowly rounded apex (fig. 80). Genitalia with the parameres considerably shorter than the parapenials, subequal to the digiti; digiti characteristically shaped and covered with very short setae; base of digitus with a single long seta (fig. 48).

Distribution.— This species is known only from Durango to Guerrero and Oaxaca, at altitudes of between 5000 and 7500 feet. (Map 62.)

Specimens examined.— 19 ♀♀, 17 ♂♂. DURANGO: 1 ♀, 5 mi. E Coyotes, 4 Aug. 1951 (HEE) [MCZ]. GUANAJUATO: 1 ♂, Yuriria, 6500 feet, 7 Aug. 1962 (HEE) [MCZ]; 1 ♂, Salvatierra, 28 July 1954 (EIS) [CIS]. MEXICO: 1 ♀, Chapingo, 28 May 1961 (FPM) [ENAC]. MORELOS: 14 ♀♀, 12 ♂♂, 3 mi. NW Cuernavaca, 6500 feet, 24 May-30 June 1959 (HEE) [CU, MCZ]; 1 ♂,



Cuernavaca, 6 June 1957 (CY) [MCZ]; 1 ♀, Tepoztlán, 20 Aug. 1956 (RRD) [MSU]. GUERRERO: 1 ♀, 1 ♂, Xucumanatlán, 7000 feet (HHS) [BMNH]. OAXACA: 1 ♂, 5 mi. E Oaxaca, 13 July 1952 (EG & CM) [CIS].

Variation. — The males exhibit no noteworthy variation except as expressed in the description above; the ventral hair-brushes are similar throughout the series, and in no case is there any silvery pubescence on the body. The females vary in size from 9 to 13 mm.; MID varies from .55 to .59 X TFD, antennal segment three from .80 to .87 X UID. In the females the longer spur of the hind tibia varies from .58 to .67 X the length of the hind basitarsus (mean .62), while the number of spines in the median row beneath the hind basitarsus varies from 9 to 14 (mean 11.5).

Anoplius (Anoplius) papago Banks

Anoplius papago Banks, 1941, *Canad. Ent.*, 73: 120 [Type: ♂, ARIZONA: Tucson (F. H. Snow) (MCZ, no. 25, 263)]. — Dreisbach, 1950, *Amer. Midl. Nat.*, 43: 584-585. — Evans, 1951, *Trans. Amer. Ent. Soc.*, 76: 356 (erroneously placed in synonymy with *tarsatus* Banks).

Anoplius subtarsatus Dreisbach, 1950, *Amer. Midl. Nat.*, 43: 578-579 [Type: ♂, NORTH CAROLINA: Raleigh, 9 May 1940 (D. L. Wray) (N. Car. Dept. Agri.)]. — Evans, 1951, *Trans. Amer. Ent. Soc.*, 76: 353 (erroneously placed in synonymy with *ventralis* Banks). New synonym.

Anoplius guatemalensis Dreisbach, 1952, *Amer. Midl. Nat.*, 48: 154-155 [Type: ♂, GUATEMALA (no further data) (MCZ, no. 30, 617)]. New synonym.

Anoplius (Anoplius) papago Evans, 1964, *Jour. Kansas Ent. Soc.*, 37: 304 (biology).

This species occupies a central position in a difficult complex. It is very closely related indeed to the preceding species, *alticola*, but the range of *alticola* is included within the much broader range of *papago* and the two nevertheless remain distinct. The case of *subtarsatus* is different; this is an eastern U. S. form supposed to differ in minor characters from *papago*. Dreisbach indicated that *papago* lacks strong hair-brushes on the third sternite, but this is by no means the case; he also indicates certain genitalic differences between these two forms, but his photographs fail to substantiate this. Actually, eastern U. S. specimens lack silvery pubescence on the head and tend to have longer setae at the base of the digitus and to average slightly

longer parameres. I have examined numerous specimens from the eastern states and from Kansas, Louisiana, and Texas, and it appears to me that these minor differences all vary clinally, so that it is not feasible to maintain *subtarsatus* as a subspecies of *papago*. I have included below all U. S. records for *papago* known to me, as the range has not been worked out previously. Separation of eastern females from the very similar species *ventralis* is difficult; the front and vertex of *papago* females is narrower than in *ventralis*, and the third antennal segment about equal to UID.

This species is also closely related to *toluca* Cameron (= *tarsatus* Banks, with which I previously confused it). However, it is broadly sympatric with that species in Mexico, and the two maintain their minor differences. North of the range of *papago* (but still mainly within the range of *toluca*) there is another, previously unrecognized form described on a later page as *dreisbachi*. The females of this form are not clearly distinguishable from those of *papago*, and it might be asked why this form should not be considered a subspecies of *papago*. Possibly it should be, but there are differences in the ventral hair-brushes and genitalia of the males of greater magnitude than is usually used to separate species in this complex.

Still another closely related form occurs south of the known range of *papago*, in Colombia and Ecuador. This is *ambatoensis* (Cameron), of which I consider *bolivari* Banks and *williamsi* Banks to be synonyms.²⁵ The genitalia and ventral hair-brushes of this form are strikingly like those of *papago*, but the setae on the digiti are straighter; furthermore it is a decidedly more bluish form than *papago*, and the front of the female averages broader. Tentatively I consider *dreisbachi*, *papago*, and *ambatoensis* to constitute a series of allopatric species, which might conveniently be called the *papago* super-species. These in turn belong with *toluca*, *alticola*, and the eastern U. S. species *illinoensis* and *ventralis* in a very closely knit species complex, the *illinoensis* species-group. The last word has surely not been said on this complex, but I do feel that study of the Mexican

²⁵ *Anoplius* (*Anoplius*) *ambatoensis* (Cameron) is a new combination; this species was described from Ambato, Ecuador, at 8600 feet, as *Hypoferreola ambatoensis* (1903, Trans. Amer. Ent. Soc., 29: 229-230). Synonymy of the two Banks' names is new; *bolivari* was described from females from Vista Nieve, Colombia, at 5000 feet (1945, Bol. Ent. Venez., 4: 104-105), *williamsi* from both sexes from several localities in Ecuador (1947, Bull. Mus. Comp. Zool., 99: 417-418).

and Central American fauna, particularly the proper definition of *papago*, has greatly clarified it.

Female. — Length 9-14 mm.; fore wing 7.5-12 mm. Black; pubescence very fine, with moderately strong bluish reflections; wings fuscous, violaceous. Clypeus, front, vertex, and front coxae with numerous setae; temples and propleura densely hairy; thoracic dorsum with scattered hairs; mesopleura and propodeum with abundant fine, dark setae; abdomen setose below and on the apical segments above, the last tergite densely bristly. Clypeus about 2.5 X as wide as high, truncate or weakly concave below. Head 1.10-1.14 X as wide as high, the vertex virtually straight across between the eye tops. Front narrow, barely wider than the two eyes taken together, MID .52-.55 X TFD, 1.17-1.23 X LID, .72-.80 X eye height; UID .86-.94 X LID. POL:OOL about as 9:10. Third antennal segment considerably longer than first two together, equally from .90 to slightly over 1.0 X UID. Characters of the thorax, wings, and fore tarsi as described for *alticola*. Longer spur of hind tibia .52-.63 X the length of the basitarsus (mean .57); spines in the median row beneath the hind basitarsus numbering 7 to 11 (mean 8.6).

Male. — Length 6-10.5 mm.; fore wing 5-9 mm. Black; pubescence with moderately strong bluish reflections, conspicuously silvery on the sides of the lower front (except in eastern U. S. specimens); wings moderately infuscated, darker along the outer margin. Head and prothorax with numerous erect setae; propodeum prominently hairy; S2 usually with a few setae, S3-5 with strong brushes of hairs which are continuous across the sternites, although shorter medially; in lateral view these hair-brushes are broad, continuous or very slightly separated at the intersegmental lines. Clypeus 2.1-2.4 X as wide as high, truncate below. Head subcircular in anterior view, slightly wider than high, vertex arched very gently above the eye tops. Front rather narrow, MID .54-.59 X TFD; UID 1.0-1.1 X LID; POL:OOL = about 4:5. Third antennal segment 2.5-3.0 X as long as wide, slightly longer than fourth segment in most specimens. Features of thorax differing in no notable way from those of *alticola*; longer spur of hind tibia .70-.80 X length of hind basitarsus. Venter with strong brushes of hairs on S3-5, as described above. SGP with the median portion narrowly elevated, hirsute, the apex narrowly rounded; toward the base, the sides of the plate flare out considerably and are unpigmented (fig. 81). Genitalia with the parameres shorter than the digiti, the portion beyond the squama 2.0-2.6 X as long as the width at the squama (except eastern U. S. specimens sometimes up to 3.0, and the parameres actually exceeding the digiti slightly); digiti shaped much as in *alticola*, but with much longer setae most of which curve strongly upward (fig. 47; see also figs. 22 and 28 in Dreisbach, 1950, and fig. 18 in Dreisbach, 1952).

Distribution. — Costa Rica to Arizona, toward the south chiefly at moderate to fairly high elevations (3000-9000 feet), also east to Florida, north to Kansas and the District of Columbia (Dreisbach

reports a paratype of *subtarsatus* from Stamford, Conn., but I have not seen this specimen). (Map 63.)

United States specimens examined. — 10 ♀♀, 18 ♂♂. DISTRICT OF COLUMBIA: 2 ♂♂, Washington, Oct. 1936 (M. S. Vogel) [MCZ]. VIRGINIA: 1 ♂, Glencarlyn, June (NB) [MCZ]; 1 ♂, Dyke, May (NB) [MCZ]. NORTH CAROLINA: 2 ♀♀, 1 ♂, Highlands, May-Aug. (Mason, Chillcott) [CNC]. TENNESSEE: 2 ♂♂, Great Smoky Mts., May, June 1957 (W. R. M. Mason) [CNC]. FLORIDA: 1 ♂, Orlando, March [MCZ]. LOUISIANA: 1 ♂, Darrow, June [MCZ]. KANSAS: 1 ♀, Manhattan, May, June (HEE, RHP) [MCZ]; 2 ♀♀, 4 ♂♂, Pottawatomie Co., May, July, Aug. (HEE) [MCZ]. TEXAS: 1 ♀, 1 ♂, Giddings, 6 July 1952 (HEE) [MCZ]; 2 ♂♂, Fedor, June (Birkman) [MCZ]; 1 ♂, 6 mi. E San Benito, 9 May 1958 (HEE) [MCZ]; 1 ♀, 5 mi. W Fort Davis, 25 July 1947 (B. D. Valentine) [MCZ]. ARIZONA: 1 ♀, near Dos Cabezas, 17 Sept. 1958 [MCZ]; 1 ♂, Tucson (F. H. Snow) [type, MCZ]; 1 ♀, 5 mi. W Portal, 5400 feet, 11 Sept. 1956 (E. Ordway) [AMNH].

Mexican and Central American specimens examined. — 100 ♀♀, 141 ♂♂. DURANGO: 1 ♀, Palos Colorados, 8000 feet, 5 Aug. 1947 (Schramel) [AMNH]. NAYARIT: 1 ♀, Vic. Compostela, 34 July [MCZ]. MICHOACAN: 1 ♀, Morelia, 15 July 1956 (RRD) [MSU]; 3 ♀♀, Tuxpan, May, July (HAS, HEE) [OSU, MCZ]. MEXICO: 1 ♀, 44 km. W Toluca, 8220 feet, 28 June 1948 (W. Nutting) [MCZ]; 2 ♀♀, 1 ♂, Ixtapan de la Sal, 4-10 Oct. 1958, 6500 feet (E. G. Matthews) [MCZ]; 1 ♀, 1 ♂, Valle de Bravo, 6500 feet, 3 Aug. 1962 (HEE) [MCZ]; 1 ♀, 33 km. N Acambay, 7600 feet, 8 Aug. 1962 (HEE) [MCZ]; 1 ♀, 7 km. S Amecameca, 8000 feet, 12 Aug. 1962 (HEE) [MCZ]; 1 ♀, W Slope Popocatepetl, 10,000 feet, 31 March 1959 (HEE) [MCZ]. MORELOS: 80 ♀♀, 131 ♂♂, Cuernavaca and vicinity, March-July 1959, 5000-7500 feet (HEE, RRD) [CU, MCZ, USNM, MSU]; 1 ♂, Tepoztlan, 15 June 1956 (C. M. Yoshimoto) [MCZ]; 1 ♂, Canyon de Lobos, near Yautepec, 13 March 1959 (HEE) [MCZ]; 2 ♂♂, Las Estacas, 3000 feet, 6 April 1959 (HEE) [MCZ]; 1 ♂, 3 mi. N Alpuyeca, 3400 feet, 9 March 1959 [MCZ]. VERACRUZ: 2 ♀♀, Minatitlan, 26 Aug.-1 Sept. 1961 (RRD) [MSU]. CHIAPAS: 1 ♀, 1 ♂, 20 mi. W San Cristobal las Casas, 3 May 1959 (HEE) [MCZ]; 1 ♀, Navenchauc, 2 April 1953 (RCB & EIS) [CIS]; 1 ♀, 9 mi. S Ixtapec, 1 April 1953 (RCB &



EIS) [CIS]; 1 ♀, 15 mi. NW Comitan, 3 Aug. 1952 (EG & CM) [CIS]. GUATEMALA: 1 ♂, no specific locality [MCZ]. HONDURAS: 1 ♀, Minas de Oro, Comay, 4000 feet, 1 June (J. B. Edwards) [MCZ]. COSTA RICA: 1 ♂, Guapiles, July 1915 (D. E. Harrower) [ANSP].

Variation. — Except for limited variation in size and some structural details, as expressed above, this species is remarkably uniform all the way from Arizona to Costa Rica. Several east Texas specimens (e.g., the male from San Benito) are virtually identical to the type, but most specimens from Texas and Kansas eastward have the pubescence duller, rather obscurely reflecting bluish. The pubescence of the lower front is cinereous or obscurely silvery in the Kansas males, also in most Texas males and that from Louisiana, but it is dark in specimens from farther east. Typically there are no long setae at the base of the digitus, but some eastern specimens have one or two fairly long setae here, and some Kansas and Texas specimens are intermediate in this respect. The parameres of one male from Washington, D. C., are unusually long (apical part measuring about 3 X as long as width at squama), but the second male from the same locality is quite different (apical part measuring only about twice the width at

the squama). Thus it appears to be impossible to draw any distinct line between *subtarsatus* and *papago*.

Anoplius (*Anoplius*) *toluca* (Cameron)

Pompilus toluca Cameron, 1893, Biol. Centr.-Amer., Hymen. II, 195 [Type: ♀, MEXICO: GUERRERO: Xucumanatlán, 7000 feet, July (HHS) (BMNH, no. 19, 688)]. — Dalla Torre, 1897, Cat. Hymen., VIII, p. 327.

Anoplius tarsatus Banks, 1919, Bull. Mus. Comp. Zool., 63: 233, 234 [Type: ♀, CALIFORNIA: Sherwood, Mendocino Co.; 1 July 1907 (CU, no. 686)]. — Dreisbach, 1950, Amer. Midl. Nat., 43: 585, 586. New synonym.

Anoplius (*Anoplius*) *ventralis tarsatus* Evans, 1951, Trans. Amer. Ent. Soc., 76: 355-357 (in part).

Anoplius (*Anoplius*) *toluca* Evans, 1964, Jour. Kansas Ent. Soc., 37: 305 (biology).

Cameron's *toluca*, like his *alticola*, has remained unrecognized by American workers since its description. Unfortunately the type is only in fair condition; it is rubbed and somewhat molded, and the antennae and wings are missing (except for the scape and one hind wing). The wing illustrated by Cameron cannot possibly go with this specimen; it is probably a wing of *Pompilus scelestus* Cresson, which was described from Guerrero by Cameron as *P. omitemensis*. Also, his figure of the head is poor, and most of the characters he uses for separating this species from *alticola* are incorrect. He does point out, however, that the longer spur of the hind tibia is shorter than in *alticola*, and this appears to be valid when used with other characters for separating these two species. I have not presented a detailed description of the type specimen below, as it is in too poor a condition. However, I feel certain that it is a specimen of what has been called *tarsatus* Banks. Formerly I considered *tarsatus* and *ventralis* only subspecifically distinct. In the light of present studies there seems little question that the two are distinct species. The male genitalia are nearly identical, but the hair-brushes on the venter show constant differences; I overlooked this earlier because I failed to recognize *papago* as a third distinct species in this complex. Specimens which I formerly considered intergrades between *ventralis* and *tarsatus* I can now assign definitely to one of these three species.

Female. — Length 8-13 mm.; fore wing 7-11 mm. Black; pubescence strongly reflecting bluish, tending to be slightly more coarse than in the preceding two species, such that the black integument is more heavily overlaid with bluish; wings fuscous, violaceous. Body in general more hairy than in the preceding two species; head, prothorax, mesopleura, and propodeum with abundant dark hair; mesonotum with quite a number of hairs, the middle and hind coxae nearly always noticeably hairy; abdomen setose as in the preceding two species. Clypeus about 2.5 X as wide as high, truncate or weakly concave below. Head 1.12-1.15 X as wide as high, the vertex very slightly arched above the eye tops. Front moderately broad, MID .56-.58 X TFD, 1.12-1.20 X LID, .80-.84 X eye height; UID .86-.94 X LID. POL:OOL about 4:5. Third antennal segment considerably longer than first two together, equal to from .82 to .92 X UID. Pronotum angulate behind; propodeum with a flattened declivity on the posterior third. Front basitarsus fairly strongly spined, the spines in the upper row usually slightly shorter than the width of the basitarsus, those in the lower row in part longer. Longer spur of hind tibia .52-.63 X the length of the basitarsus (mean .58); spines in the median row beneath the hind basitarsus numbering 6 to 10 (mean 7.7). Marginal cell of fore wing 1.0-1.3 X its length from the wing tip; SMC3 strongly narrowed above.

Male. — Length 5.5-11 mm.; fore wing 4.6-9 mm. Black; pubescence wholly dark, strongly reflecting bluish; wings moderately infuscated, darker along outer margin. Head, thorax, and propodeum with abundant dark setae, including a few on the thoracic dorsum and usually a few on the middle and hind coxae; S3 with a few long, slanting setae in a transverse band; S4 with a stronger transverse band of setae well forward on the sternite, so that there is a bare space behind it, separating this band widely from the slightly weaker band on S5; these hair-bands are continuous across the sternites, although shorter medially. Clypeus 2.2-2.5 X as wide as high. Head subcircular in anterior view, the vertex forming an even arc above the eye tops; MID .56-.62 X TFD, UID 1.0-1.2 X LID; POL:OOL about 4:5. Third antennal segment 2.5-3.0 X as long as wide, in most specimens slightly longer than fourth segment. Last segment of front tarsus strongly lobed on inner margin, widest about mid-way of its length. Longer spur of hind tibia .7-.8 X length of hind basitarsus. SGP essentially as described and figured for *papago*. Genitalia with the parameres elongate, exceeding the digiti and nearly or quite as long as the parapenials, the portion beyond the squama at least 3.5 X the width at the squama; digiti spindle-shaped, the apex acuminate, the inner margin gently concave, the disc covered with fairly long, mostly straight setae; base of digitus with one long seta and a few shorter ones (fig. 50) (fig. 21 in Dreisbach, 1950, and fig. 115 in Evans, 1951, both purported to represent the genitalia of *tarsatus* Banks, actually represent a partially sympatric sibling species described below as *dreisbachi*).

Distribution. — California and western Texas to Costa Rica, in Mexico and Central America chiefly at moderate to fairly high alti-

tudes (up to 8000 feet). This species has also been introduced into the Hawaiian Islands, where it is common. The marginal U. S. records presented by Evans in 1951 are of little significance, since three species were being confused under one name. (Map 64.)

United States specimens examined. — 54 ♀♀, 97 ♂♂. CALIFORNIA: Plumas, Mendocino, Glenn, Sonoma, Yolo, Placer, Eldorado, Amador, Lake, Marin, Contra Costa, Alameda, Tuolumne, Monterey, Kern, San Luis Obispo, Santa Barbara, Ventura, Los Angeles, San Bernardino, Riverside, and San Diego Counties, May-Oct. [MCZ, CIS, CAS]. ARIZONA: Pima, Graham, Cochise Counties, April-Oct. [MCZ, CU, CIS, AMNH, UA]. NEW MEXICO: 1 ♀, Jemez Springs, July (J. Woodgate) [MCZ]. TEXAS: 1 ♀, 1 ♂, 6-20 mi. W Ft. Davis, July, Aug. (HEE, B. D. Valentine) [MCZ].

Mexican and Central American specimens examined. — 32 ♀♀, 37 ♂♂. BAJA CALIFORNIA: 1 ♀, San Vicente, 8 July 1963 (JP) [CIS]. DURANGO: 1 ♂, 5 mi. W Durango, 14 May 1962 (LS) [UCD]. HIDALGO: 1 ♀, Guerrero Mills (W. M. Mann) [MCZ]. PUEBLA: 1 ♂, 14 mi. W Huauchinango, 17 June 1951 (PDH) [CIS]. MICHOACAN: 2 ♀♀, 3 mi. E Carapan, 6500 feet, July (HEE, FDP) [MCZ, UCD]; 1 ♀, 14 mi. NW Zitacuaro, 24 Aug. 1959 (AM & LS) [UCD]; 1 ♀, 10 km. E Morelia, 5 Aug. 1962 (HEE) [MCZ]; 1 ♂, Tzintzuntzan, 7000 feet, 6 Aug. 1962 (HEE) [MCZ]. QUERETARO: 1 ♂, 10 mi. E San Juan del Rio, 6500 feet [KU]. MEXICO: 1 ♀, 3 ♂♂, Valle de Bravo, 6500 feet, 3 Aug. 1962 (HEE) [MCZ]; 2 ♀♀, Teotihuacan, July (HEE, RRD) [MCZ, MSU]; 1 ♀, 7 km. S Amecameca, 12 Aug. 1962 (HEE) [MCZ]; 1 ♀, Atlacomulco, 18 Aug. 1954 [KU]; 1 ♂, Ixtlahuaca, 7300 feet, 30 July 1954 (J. G. Chillcott) [CNC]. MORELOS: 1 ♀, Cuernavaca, 5500 feet, 27 May 1959 (HEE) [MCZ]; 1 ♂, 3 mi. NW Cuernavaca, 6500 feet, 24 May 1959 (HEE) [MCZ]. CHIAPAS: 11 ♀♀, 25 ♂♂, San Cristobal las Casas, 7500 feet, April, July-Aug. (HEE, EG & CM) [CU, MCZ, CIS]; 1 ♂, 7 mi. W San Cristobal, 6350 feet, 27 Aug. 1957 (HAS) [OSU]; 1 ♀, 15 mi. NW Comitán, 3 Aug. 1952 (EG & CM) [CIS]; 1 ♀, Nachic, 8000 feet, 27 April 1959 (HEE) [MCZ]. EL SALVADOR: 2 ♀♀, 1 ♂, Santa Ana, Jan., Mch., Oct. [USNM]; 4 ♀♀, 1 ♂, Cerro Verde, 29 June 1963 (M. Irwin) [UCD]. COSTA RICA: 1 ♀, La Palma (M. Valerio) [USNM].



Variation. — The specimens studied show relatively little variation except as expressed in the above descriptions. Some of the specimens from the periphery of the range are, however, worthy of note. The single Texas male has the hair-brushes on S4 and 5 somewhat stronger than usual, especially that on S5; however, the bands are still well separated, and the genitalia entirely typical of the species. The males from El Salvador both have an unusually hairy thorax and first tergite, and there are several long hairs on S2 and more than usual on S3; however, the hairbands on S4 and 5 are unusually thin, consisting of little more than a single row of long hairs each, that on S5 actually being discontinuous medially, as is typical of *ventralis* of the eastern United States. In these specimens the setae on the digitus are more closely packed than usual and tend to be more angulate at their apices. The females from El Salvador and Costa Rica have the marginal cell removed from the wing tip by no more than its own length; however, some Chiapas females are no different in this respect. It is conceivable that a separate subspecies should be recognized for specimens from the southern extremities of the range, but at present not enough material is available to justify such a step.

Anoplius (Anoplius) dreisbachi new species

Anoplius tarsatus Dreisbach, 1950, Amer. Midl. Nat., 43: 585, 586, figs. 17, 21 (misidentification; not *tarsatus* Banks).

Anoplius (Anoplius) ventralis tarsatus Evans, 1951, Trans. Amer. Ent. Soc., 76: 355-357 (in part, including Fig. 115).

This species is not known to enter Mexico, but may well occur in the northern part. It is described here as part of the clarification of this complex, as it has previously been confused with the preceding species. The females can be told from those of *toluca* by the less coarse and less intensely bluish pubescence and by the generally narrower front. I am at present unable to present any characters for separating the females of *dreisbachi* and *papago*. The ranges of these two species are not presently known to overlap, but it is possible that they do so to some extent. The males can be distinguished readily from those of both *papago* and *toluca* by the nature of the brushes of hair on the venter, as expressed in the key. In the male genitalia, the parameres are short, much as in *papago*, while the digits are very similar to those of *toluca*.

Allotype. — ♀, WASHINGTON: Bothell, King Co., 22-26 Aug. 1954 (H. E. and M. A. Evans) [MCZ].

Description of female allotype. — Length 11 mm.; fore wing 9.8 mm. Black; pubescence very fine, moderately strongly reflecting bluish except somewhat brownish on the clypeus, coxae, and most of the legs; wings moderately infuscated, darker apically, violaceous. Head, prothorax, mesopleura, and propodeum with abundant dark hair; mesonotum with scattered setae; middle and hind coxae sparsely short-setose; abdomen setose ventrally, the last tergite densely bristly. Clypeus 2.5 X as wide as high, its apical margin weakly concave. Head 1.16 X as wide as high, the vertex passing straight across between the eye tops. Front rather narrow, MID .54 X TFD, 1.15 X LID, .82 X eye height; UID .91 X LID. POL:OOL = 5:6. First four antennal segments in a ratio of about 28:7:42:34, segment three equal to .92 X UID. Pronotum angulate behind. Propodeum with a nearly flat declivity on the posterior third. Front basitarsus with one spine in the upper row nearly as long as the width of the tarsus, one of the spines in the lower row longer than the width of the tarsus. Longer spur of hind tibia .63 X as long as the hind basitarsus; spines in the median row on the hind basitarsus numbering 9. Marginal cell of fore wing removed from wing tip by about its own length; SMC3 narrowed above by nearly .8.

Holotype. — ♂, same data as allotype [MCZ, no. 30, 973].

Description of male type.—Length 10 mm.; fore wing 9 mm. Black; pubescence colored as in female except conspicuously silvery on sides of lower front; wings moderately infuscated, darker along outer margin, somewhat violaceous. Head, prothorax, mesopleura, and propodeum with abundant dark setae; mesonotum with a few setae; S3 with a number of fairly long, slanting setae, but these do not form a brush comparable to that on the next two sternites; brush on S4 covering most of the sternite, leaving a narrow apical margin bare, so that this brush is very narrowly separated from that on S5, both brushes continuous across the sternites but with the hairs shorter medially. Clypeus 2.1 X as wide as high. Head slightly wider than high; vertex forming a weak arc above the eye tops. MID .58 X TFD; UID 1.07 X LID; OOL slightly exceeding POL. First four antennal segments in a ratio of about 4:1:4:4, segment three about 2.5 X as long as thick. Last segment of front tarsus strongly lobed on the inner margin, this segment widest about mid-way of its length. Longer spur of hind tibia .75 X as long as hind basitarsus. Fore wing as in female. Venter with strong hair-brushes as described above. SGP broadened toward the base, the side-pieces weakly pigmented, about as figured for *papago*. Genitalia with the parameres shorter than the digiti, the portion beyond the squama only about 2.5 X the width at the squama; digiti spindle-shaped, the apex acuminate, disc covered with fairly long, mostly straight setae; base of digitus with one or two fairly strong setae (fig. 49; see also fig. 21 in Dreisbach, 1950, and fig. 115 in Evans, 1951).

Distribution.—Arizona and southern California to Colorado, Wyoming, and British Columbia, chiefly in the Transition Zone.

Paratypes.—ARIZONA: 1 ♂, Vail Lake, Aug. [CU]; 1 ♂, Flagstaff, Sept. [CIS]; 2 ♂♂, Mormon Lake, Coconino Co., Aug. [MCZ]; 1 ♀, Lake Mary, Coconino Co., Aug. [MCZ]. COLORADO: 1 ♂, Mesa Verde, Aug. [AMNH]; 1 ♂, Boulder, July [MCZ]; 1 ♂, Troublesome, 7345 feet, 8 June 1908 (S. A. Rohwer) [USNM]. UTAH: 2 ♀♀, 3 ♂♂, Randolph, Rich Co., July [UCD]; 2 ♂♂, Garden City, Rich Co., July [UCD]. NEVADA: 1 ♂, Reno, Sept. [CIS]; 1 ♂, Verdi, Washoe Co., June [UCD]; 1 ♀, 14 mi. SE Wellington, Douglas Co., Aug. [UCD]. WYOMING: 1 ♂, Norris area, Yellowstone, Aug. [CIS]. BRITISH COLUMBIA: 1 ♀, 6 ♂♂, Squamish, Aug. [CNC]; 1 ♀, Keremeos, July [CNC]; 1 ♀, Atbara, Sept. [CU]. WASHINGTON: 2 ♀♀, 1 ♂, Bothell, King Co., Aug. [MCZ, CU]; 2 ♂♂, Lopez Island, Aug. [CU]; 2 ♂♂, Port Townsend, July [CIS]. OREGON: 1 ♂, Mt. Hood, 7000 feet, Aug. [UCD]; 1 ♀, 1 ♂, Corvallis, July, Sept. [MCZ]; 1 ♀, 14 mi. E of The Dalles, July [OSU]; 1 ♂, Detroit, 11 July 1907 (J. C. Bridwell) [USNM]. CALIFORNIA: 2 ♂♂, Angora Peak, 8600 feet, July [CIS]; 1 ♂, Tamarack Lake,

7700 feet, July [CIS]; 1 ♀, 1 ♂, Hallelujah Jct., Lassen Co., July, Sept. [CIS, UCD]; 1 ♀, Sierraville, Sierra Co., July [CIS]; 1 ♀, 1 ♂, Yuba Pass, Sierra Co., July [UCD]; 3 ♂ ♂, Boca, Nevada Co., June, July [CIS, UCD]; 1 ♀, China Flat, Eldorado Co., June [CIS]; 2 ♀ ♀, 2 ♂ ♂, Echo Lake, Eldorado Co., July [CIS, MCZ]; 3 ♀ ♀, 3 ♂ ♂, Leland Meadows, Tuolumne Co., Aug. [CIS, CAS, UCD]; 2 ♂ ♂, Pinecrest, Tuolumne Co., Aug. [CIS]; 1 ♀, 2 ♂ ♂, Sonora Pass, Tuolumne Co., Aug. [CIS, UCD]; 1 ♂, Strawberry, Tuolumne Co., July [CIS]; 1 ♀, Petaluma, Sonoma Co., Sept. [UCD]; 1 ♂, McClure's Beach, Marin Co., July [CIS]; 1 ♂, Inverness, Marin Co., July [UCD]; 1 ♀, Arroyo Mocho, Alameda Co., July [CIS]; 2 ♂ ♂, San Francisco, Aug. Sept. (J. C. Bridwell) [USNM]; 1 ♂, Lobos Creek, San Francisco, May [CIS]; 6 ♂ ♂, Ingleside, Aug. [CU, MCZ]; 1 ♂, Carmichael, Sacramento Co., May [UCD]; 1 ♂, Pickel Mdw., Mono Co., Aug. [UCD]; 1 ♂, Mineral King, Tulare Co., Aug. [MCZ]; 1 ♂, 7 mi. SE Pine Flat, Tulare Co., July [CIS]; 1 ♀, Yosemite Nat. Pk., July [CIS]; 1 ♂, Big Sandy Flat, Madera Co., July [CIS]; 1 ♂, Glacier Lodge, Inyo Co., July [CIS]; 1 ♂, Big Pine, Inyo Co., June [CIS]; 1 ♂, San Simeon Bch., San Luis Obispo Co., Aug. [CIS]; 1 ♂, 2.5 mi. S Arroyo Grande, San Luis Obispo Co., June [CIS]; 2 ♀ ♀, 9 ♂ ♂, Goleta, Santa Barbara Co., June [CIS, UCD, USNM, MCZ]; 1 ♂, Jenks Lake, San Bernardino Co., Aug. [CIS]; 1 ♂, Big Bear Lake, San Bernardino Co., Aug. [MCZ]; 1 ♂, San Bernardino Mts., July [CIS]; 1 ♀, San Diego, Aug. [MCZ].

Variation. — The females vary in length from 9 to 14 mm.; MID varies from .52 to .56 X TFD, antennal segment three from .75 to .95 X UID; the longer spur of the hind tibia varies from .52 to .70 X the length of the hind basitarsus, the number of spines in the median row beneath the hind basitarsus from 7 to 12 (mean 9.5). The males vary in length from 6.5 to 11 mm. In all available males the front is at least slightly silvery. The number of strong setae on S3 varies considerably; in some specimens there are only a few, in others a fairly strong brush, but in no case nearly as strong as that on S4. Some slight variation can be noted in the length of the parameres, but in no case are they nearly as long as in *toluca*.

Genus **POMPILUS** Fabricius²⁶

Pompilus Fabricius, 1798, Suppl. Ent. Syst., pp. 212, 246-252 [Type species: *Pompilus pulcher* Fabricius, fixed by Opinion 166 of the Internat. Comm. Zool. Nomen., 1945]. — Evans, 1951, Trans. Amer. Ent. Soc., 77: 203-275 (first used with present limits for revision of U. S. spp.). — Evans, 1953, Ann. Ent. Soc. Amer., 46: 529-543 (Mexican spp.).

Generic characters. — Size 3 to 25 mm.; color predominantly black, some species with reddish coloration on the abdomen and legs, pronotum occasionally bordered with pale; apical tergite of female bare or with slender, flexible setae, but without stout bristles. Mandibles with one or two teeth on inner margin. Malar space very short. Antennae slender, segment three in female at least 3 X as long as thick, in male usually but not always more than twice as long as thick. Postnotum a transverse band of variable width, never strongly expanded on each side of median line. Front tarsus of female with or without a tarsal comb; apical tarsal segments with or without spines beneath. Claws of female dentate, those of male dentate except front tarsal claws sometimes bifid. Pulvillar pad and comb of very variable development. Wing venation as in *Anoplius* except several species with only two SMCs (figs. 21, 22). Venter of male without brushes of long hairs. Male genitalia variously developed; basal hooklets single, double, or wanting (figs. 55-58).

Distribution. — Cosmopolitan. Seven subgenera are recognized for the American species; several of these occur also in the Old World, where there are several additional subgenera.

Remarks. — This genus is difficult to characterize, consisting as it does of an assortment of species not sufficiently specialized to put in other genera. I doubt very much if the genus is monophyletic, yet it is difficult to find strong, useful characters which will separate the subgenera in a way sufficiently convincing to justify calling them genera. The following key to subgenera is taken almost verbatim from my 1953 study of the Mexican fauna. One subgenus, *Anoplochares*, is not recorded from Mexico or Central America and is therefore not considered further; however, *P. (Anoplochares) apicatus* Provancher has been taken at Brownsville, Texas, and surely must occur in northeastern Mexico.

²⁶ For additional references, see Evans, 1951, also below under the several subgenera.

*Key to Subgenera**Females*

1. Ultimate tarsal segments either without spines beneath, or with from one to three spines near the base, and apical half bare; posterior margin of pronotum arcuate or obtusely angulate 1
 Ultimate tarsal segments with a more or less complete row of spines beneath, like the preceding segments; posterior margin of pronotum usually rather sharply angulate 5
2. Tarsal comb absent; spatium frontale elevated, the front abruptly declivous between the antennal sockets to the lower plane of the area frontalis *Xenopompilus* Evans
 Tarsal comb present; spatium frontale not prominently elevated as above 3
3. Front basitarsus short, not over 5 X as long as wide, with only two comb-spines; apex of abdomen smooth, with only minute setae if any *Perissopompilus* Evans
 Front basitarsus more than 6 X as long as wide, usually with three comb-spines; apex of abdomen with a few long setae above and below 4
4. Ultimate tarsal segments without spines beneath; propodeum and mesopleura bare or with dark hairs; pulvillar comb weak *Hesperopompilus* Evans
 Ultimate tarsal segments with from one to three spines beneath near the base; propodeum, mesopleura, temples, and front coxae with abundant white hair; pulvillar comb strong *Xerochaes* Evans
5. Labrum broadly exerted beyond apical margin of clypeus; tarsal comb absent *Anoplochaes* Banks
 Only the apical margin of the labrum visible below the clypeus; tarsal comb present except in one species 6
6. Marginal cell of fore wing removed from wing tip by at least 1.3 X its own length, SMC2 and 3 narrowed above *Ammosphex* Wilcke
 Marginal cell of fore wing longer, removed from wing tip by approximately its own length; SMC2 and 3 rather wide above (fig. 22) *Arachnospila* Kincaid

Males

1. Ultimate segment of front tarsus slender, symmetrical or nearly so, at most very obscurely produced on the inner margin 2
 Ultimate segment of front tarsus broader, distinctly produced along the inner margin, asymmetrical 5
2. Apical margin of clypeus rounded; SGP usually with basal (internal) appendages consisting of matted setae (figs. 83, 84) *Hesperopompilus* Evans

- Apical margin of clypeus truncate; SGP without appendages of this kind .. 3
3. Postnotum on the median line much shorter than the metanotum; propodeum and mesopleura with abundant long, whitish hairs *Xerochares* Evans
- Postnotum on the median line about as long as the metanotum; propodeum and mesopleura without long white hairs, the propodeum, however, with suberect silvery setulae 4
4. Pubescence of the abdomen forming dense, prominent bands at the apices of the tergites; sixth sternite with a specialized median area; basal hooklets of genitalia double *Perissopompilus* Evans
- Pubescence of abdomen uniformly silvery, not forming bands; sixth sternite not modified; basal hooklets absent *Xenopompilus* Evans
5. Ultimate segment of front tarsus very strongly lobed along the inner margin, the segment widest about mid-way; aedoeagus with tooth-like projections along the margins *Ammosphex* Wilcke
- Ultimate segment of front tarsus less strongly lobed, the segment widest about two-thirds the distance from the base; aedoeagus simple 6
6. Labrum partially exserted; subgenital plate very narrow, strongly keeled *Anoplochares* Banks
- Labrum not or scarcely visible beyond the apical margin of the clypeus; subgenital plate broader than above, keeled or not *Arachnospila* Kincaid

Subgenus **HESPEROPOMPILUS** Evans

Hesperopompilus Evans, 1948, Proc. Ent. Soc. Washington, 50: 141-149 [Type species: *Pompilus orophilus* Evans, original designation] (proposed as subgenus of *Pompilus*). — Dreisbach, 1949, Ent. Amer., (n.s.) 29: 4, 6, 10, 42, fig. 23 (not Fig. 22 as stated) (given generic status). — Evans, 1951, Trans. Amer. Ent. Soc., 76: 209-218 (subgenus; review of U. S. spp.).

Subgeneric characters. — Length 3.5-10 mm. Clypeus of male convexly rounded apically, that of female rounded or truncate. Antennae of female elongate, those of male more compact, segment three from 1.2 to 2.5 X as long as thick, frequently shorter than fourth segment. Pronotum arcuate or subangulate behind. Propodeum with or without erect hairs. Front basitarsus of female slender, more than 6 X as long as thick, bearing three (rarely two or four) comb-spines, the spines very slender. Apical tarsal segments without spines beneath in both sexes. Last segment of front tarsus of male unmodified, barely if at all produced on the inner margin, inner claw of this tarsus bifid, all other claws dentate. Pulvillar pad small, the comb variable, of not more than about 15 setulae. Fore wing with two or (more commonly) three SMCs. Abdomen of female with a few terminal setae. Male SGP with two small, palpus-like lateral basal structures, apparently consisting of matted setae, visible

only upon dissection (absent in one species). Male genitalia with the basal hooklets single or absent; parapenials stout, compressed, in lateral view rather wide (figs. 57, 58).

Distribution. — Western North America, from Baja California, Sonora, and New Mexico to Nebraska, Alberta, and Idaho.

Remarks. — I present here a revision of all seven known species of this subgenus, since numerous additional specimens and three new species have been found since my last treatment of the group. Only four species are known to enter Mexico (all in Baja California or Sonora) but two others have been taken close to the Mexican border.

Key to Species ²⁷

Females

1. Wholly black, the pubescence strongly reflecting bluish or blue-green; pronotum relatively short 2
 Abdomen largely rufo-ferruginous, the hind legs partly of this color; pronotum relatively long 4
2. Front very narrow (MID .50-.54 X TFD); fore wing with the marginal cell short, nearly or fully twice its own length from the wing tip; postnotum nearly as long as metanotum *orophilus* Evans
 Front broader (MID .58-.61 X TFD); fore wing with the marginal cell longer, removed from wing tip by not more than 1.5 X its own length; postnotum a very narrow transverse strip 3
3. Propodeum with a considerable amount of short hair on the sides; propodeal declivity strong, its sides slightly prominent; pulvillar comb strong for this subgenus *jacintoensis* Evans
 Propodeum without erect hairs and with the declivity rather indistinct, its sides not at all prominent; pulvillar comb very weak *hilli* Evans
4. Fore wing with two SMCs; pronotum with whitish markings on the collar and posterior margin; apical margin of clypeus weakly convex, subtruncate *serrano* n. sp.
 Fore wing with three SMCs; pronotum without whitish markings; apical margin of clypeus more distinctly rounded 5
5. Length about 8.5 mm.; front and vertex wide (MID .61 X TFD; third antennal segment only .68 X UID); SMC2 1.3 X as wide as high *idahoensis* n. sp.
 Length 6-7 mm.; front and vertex narrower than above (MID .56-.60 X TFD); SMC2 nearly or quite twice as wide as high *rufopictus* Evans

²⁷ One species, *idahoensis*, is known only from the female, while another, *pacis*, is known only from the male. All known species of *Hesperopompilus* are included in this key.

Males

1. Fore wing with only two SMCs; abdomen partly rufous; genitalia as in fig. 58 *serrano* n. sp.
Fore wing with three SMCs; abdomen without rufous markings; genitalia not exactly as above 2
2. Posterior margin of pronotum with a pale stripe; third antennal segment about or more than twice as long as thick; margins of aedoeagus strongly sinuate 3
Posterior margin of pronotum without a pale stripe; third antennal segment not more than about 1.5 X as long as thick, much shorter than fourth segment; aedoeagus slender and with nearly parallel sides 4
3. SGP moderately broad, tapering apically; POL equal to or slightly less than OOL; length 6.5-9.5 mm. *hilli* Evans
SGP very slender, nearly linear; POL considerably exceeding OOL; length 5-7 mm. *orophilus* Evans
4. Pubescence without bluish reflections, silvery and brownish; size small (3.5-5 mm.); propodeum not hairy, the front but slightly so; SGP tapering apically *rufopictus* Evans
Pubescence with strong bluish reflections; size larger, 7.5-10.5 mm.; propodeum with dark or pale erect hair; SGP broad, broadly rounded apically 5
5. Parameres very short (fig. 57); tibia without silvery pubescence on outer side; propodeum with coarse, partially erect silvery pubescence and whitish erect hairs; SGP without basal hair-tufts (fig. 84) *pacis* n. sp.
Parameres exceeding the other genital appendages; tibia with silvery pubescence on outer side; propodeum often with dark setae; SGP with lateral basal tufts of compacted setae (as in fig. 83) *jacintoensis* Evans

***Pompilus (Hesperopompilus) pacis* new species**

Holotype. — ♂, BAJA CALIFORNIA: La Paz, 8 Oct. 1955 (FXW) [CAS].

Description of male type. — Length 8 mm.; fore wing 7 mm. Black, except the apical tergite mostly whitish; pubescence with strong bluish-green reflections, except silvery as follows: temples, clypeus, scape, greater part of front, pronotum except on sides, mesoscutum except anteriorly, scutellum except in center, metanotum, propodeum (extremely coarse and erect posteriorly), parts of coxae, base of first tergite, most of apical two tergites; wings subhyaline, with a faint whitish bloom, strongly infuscated along outer margin. Front and scape with abundant short, brownish hair; occiput, temples, and the entire thorax, including the coxae, clothed with short whitish hair; first tergite with whitish hair, the abdomen otherwise with only some short, inconspicuous hair. Clypeus 1.8 X as wide as high, its apical margin rounded. Head 1.13 X as wide as high,

the vertex arched slightly above the eye tops, somewhat prominent at the ocellar triangle. MID .62 X TFD; eyes strongly diverging above, UID 1.14 X LID; POL and OOL equal. First four antennal segments in a ratio of about 15:7:10:11, segment three 1.3 X as long as wide. Pronotum arcuate behind, with a small median angulation; scutellum very prominent medially; postnotum strong, on the midline nearly as long as the metanotum. Propodeum with the median line impressed at the base, with a flat declivity on the posterior third, disc covered with erect whitish pile as described above. Inner claw of front tarsus strongly curved and somewhat bifid, remaining claws dentate. Longer spur of hind tibia half the length of the basitarsus. Hind wing with the anal and cubital veins interstitial on the media; fore wing with the transverse median vein meeting media well beyond the origin of the basal vein; marginal cell removed from wing tip by 1.2 X its own length; SMC2 and 3 both slightly wider than high, the third narrowed by two-thirds above, the third intercubital vein somewhat angulate. S4 and 5 somewhat emarginate apically, S6 with a strong V-shaped emargination. SGP broad, the apex broadly rounded, the midline somewhat elevated toward the base; base completely without the processes found in other members of this subgenus (fig. 84). Genitalia characterized by short, obliquely truncate parameres; digiti much exceeding the parameres, rounded apically, clothed with short setae; basal hooklets absent; aedoeagus elongate, simple (fig. 57).

Remarks. — This curious species is known only from the type. I had at first considered this specimen to be nothing more than a *jacintoensis* male of somewhat different coloration and pilosity, but the genitalia are of very different form. The SGP is very similar to that of *jacintoensis* but the basal tufts of matted setae occurring in that species and all other *Hesperopompilus* seem to be entirely wanting. Probably *pacis* is a specialized member of this subgenus and the tufts have been lost, but it is impossible to be sure of this; knowledge of the female would be helpful. (Map 65.)

Pompilus (*Hesperopompilus*) *jacintoensis* Evans

Pompilus (*Hesperopompilus*) *jacintoensis* Evans, 1948, Proc. Ent. Soc. Wash., 50: 146-148 [Type: ♀, CALIFORNIA: San Jacinto Mts., July 1912 (J. C. Bridwell) (USNM, no. 58, 631); male misidentified]. — Evans, 1951, Trans. Amer. Ent. Soc., 77: 212-214. — Evans, 1956, Ent. News, 67: 9.

Pompilus (*Hesperopompilus*) *evagetoides* Evans, 1951, Trans. Amer. Ent. Soc., 77: 217-218 [Type: ♂, BAJA CALIFORNIA: 20 mi. N Mesquital, 27 Sept. 1941 (ESR & RMB) (CAS)]. Synonymy by Evans, 1956.

Female. — Length 8.5-12 mm. Black; pubescence deep Prussian blue,

fading to violet in older specimens; fore wings fuscous, slightly darker along outer margin, somewhat violaceous; hind wings subhyaline basally, fuscous apically. Head and pronotum with considerable dark hair; thoracic dorsum and middle and hind coxae slightly hairy; propodeum with a considerable amount of short hair on the sides; abdomen slightly setose apically. Clypeus 2.4-2.7 X as wide as high; front broad, MID .58-.61 X TFD; UID .85-.93 X LID; vertex weakly arched above the eye tops. POL and OOL subequal, or either may be slightly the greater. Antennae moderately elongate, segment three measuring .75 to .90 X UID. Pronotum short, broadly subangulate behind. Postnotum a thin transverse line. Propodeum with the declivity well defined and slightly concave, its sides rather prominent, especially below. Front basitarsus with three long, slender comb-spines, the apical one about as long as the second tarsal segment. Pulvillar comb of about 15 fairly strong setulae. Fore wing with the marginal cell removed from the wing tip by 1.2-1.5 X its own length, the radial vein angled at the third intercubital vein; SMC2 and 3 both wider than high, the third narrowed by .7 to .9 above.

Male. — Length 7.5-10.5 mm. Black, apical tergite often with a white spot, hind tibia sometimes with a white streak; pubescence in large part deep bluish, silvery at least on the front and temples, underside of scape, sides of scutellum and metanotum, outer sides of tibiae, and apical tergite, usually also on the anterior and posterior margins of the pronotum, propodeum, coxae, and apical margins of some of the basal tergites; wings subhyaline or lightly infuscated, darker toward the outer margins. Front, vertex, temples, and propleura densely hairy; propodeum often with a considerable amount of fine, dark hair; venter with scattered, inconspicuous setae. Clypeus about 1.8 X as wide as high; front broad, MID .60-.65 X TFD; inner orbits diverging above, UID 1.1-1.2 X LID. Vertex forming a slight arc above tops of eyes; POL and OOL subequal. Third antennal segment 1.3-1.5 X as long as thick, much shorter than fourth segment. Pronotum subangulate to arcuate behind; postnotum very short; propodeum with a short declivity, the sides of which are slightly prominent. Wings about as in female, SMC3 sometimes triangular. SGP broad, the apex broadly rounded, the median line rather strongly elevated. Genitalia with the parameres longer than the other parts, with broad, setose expansions near the base; digiti short, with numerous fairly long setae; basal hooklets angular but not actually hook-like; parapenials stout, strongly curved ventrad; aedoeagus slender, with several apical setae (see figs. 175 and 205 in Evans, 1951).

Distribution. — Southern California, southern Arizona, Baja California, and Sonora. (Map 65.)

Specimens examined. — 19 ♀♀, 10 ♂♂. CALIFORNIA: 1 ♀, Santa Barbara Co., Santa Ynez Mts., 24 June 1949 (RMB) [UCD]; 1 ♀, Los Angeles Co., Camp Baldy, 11 July 1950 [CIS]; 1 ♂, Glendale, Los Angeles Co., 3 May 1945 (EIS) [UCD]; 1 ♀, San Jacinto

Mts., Riverside Co., July [type, USNM]; 1 ♂, 2 mi. NE Lakeside, San Diego Co., 29 March 1961 (JP) [CIS]; 11 ♀♀, 5 ♂♂, San Diego & vic., June-Oct. (H. A. Hill, HEE) [MCZ, CU, San Diego Mus.]. ARIZONA: 1 ♂, 3 mi. W Oracle, 12 June 1962 (JB) [UA]; 1 ♀, Yuma, 13 Apr. 1955 [UA]; 1 ♀, Tucson, 29 May 1962 (LS) [UCD]. SONORA: 1 ♀, Alamos, 12 Apr. 1963 (G. Frankie) [CIS]. BAJA CALIFORNIA: 1 ♀, Cedros Island, 3 June 1925 (H. H. Keifer) [CAS]; 2 ♂♂, 20 mi. N Mesquital, 27 Sept. 1941 (ESR & RMB) [CAS, ANSP]; 1 ♀, San Felipe, 26 Mch. 1963 (G. Stage) [CIS].

***Pompilus (Hesperopompilus) hilli* Evans**

Pompilus (Hesperopompilus) jacintoensis Evans, 1948, Proc. Ent. Soc. Wash., 50: 146-148 (male; misassociated with type female). — Evans, 1951, Trans. Amer. Ent. Soc., 77: 212-214 (male).

Pompilus (Hesperopompilus) hilli Evans, 1957, Pan-Pac. Ent., 33: 183-184 [Type: ♂, CALIFORNIA: Pomona Mts., Sept. (H. C. Fall Coll.) (MCZ, no. 24, 770)].

The female of this species has not previously been described. It is probable that this species enters northwestern Mexico, but at present it is known only from two localities in southern California.

Plesiallotype. — ♀, CALIFORNIA: Inyo Co., Surprise Canyon, Panamint Mts., 24 April 1957, on *Eriogonum inflatum* (PDH) [CIS].

Description of female plesiallotype. — Length 10 mm.; fore wing 7.3 mm. Black; pubescence wholly dark, strongly reflecting various shades of blue and violet; fore wings moderately infuscated, darker along outer margin, strongly violaceous; hind wings subhyaline, apex infuscated. Head and propleura with rather dense, fine setae; front and vertex sparsely setose; body, including propodeum, otherwise wholly without erect hairs except for a few on the abdomen ventrally and apically. Clypeus 2.4 X as wide as high, its margin polished, very weakly convexly rounded, almost truncate. Front of moderate breadth, MID .58 X TFD; UID .85 X LID; vertex arched very weakly above the eye tops. POL:OOL = 9:10. Antennae slender, first four segments in a ratio of about 20:7:33:28, segment three equal to .92 X UID. Pronotum short, broadly but distinctly angulate behind. Postnotum a thin transverse line. Propodeum impressed medially, with a distinct, flattened declivity on the posterior third, the sides of the declivity not at all prominent. Front basitarsus with three comb-spines, the apical one not quite as long as the second tarsal segment. Pulvillar comb weak, of only about seven weak, diverging setulae. Anal vein of hind wing meeting media slightly before cubital fork; basal and transverse median veins of fore wing interstitial; marginal cell removed from wing tip by

approximately its own length, the radial vein somewhat angled at the third intercubital vein; SMC2 and 3 about the same width, both wider than high, the third narrowed above by slightly more than half.

Male. — Length 6.5-9.5 mm. Black, posterior margin of pronotum with a pale yellowish stripe, narrowly interrupted medially; pubescence as in female except silvery on lower front, scape beneath, posterior slope of propodeum, and hind coxae above; wings nearly hyaline, outer margin of fore wing and apex of hind wing strongly infuscated. Head and propleura with some short, fine hairs; body otherwise virtually without erect hairs. Clypeus 1.7 X as wide as high, its apical margin rounded. Head considerably wider than high, TFD 1.15 X VFD; MID .55-.57 X TFD; UID 1.10-1.17 X LID. Vertex arching weakly above eye tops; POL equal to or slightly less than OOL. Third antennal segment 2.3-2.5 X as long as thick, at most very slightly shorter than fourth segment. Pronotum broadly angulate behind. Propodeum with the median line impressed, the slope rather abrupt on the posterior fourth. Wings much as in female, SMC3 much narrowed above; in one specimen (the type) SMC3 is no wider than high. S3-5 arcuately emarginate behind; S6 with a V-shaped emargination. SGP moderately slender, acute apically, the basal palpi strongly developed. Genitalia with the parameres short and slender, exceeded by the digiti, which bear several strong setae on their outer margin; parapenial lobes strongly S-shaped; basal hooklets present; aedoeagus broad, constricted just below apex (see figs. 173 and 202 in Evans, 1951).

Distribution. — Mountains of southern California (Inyo and Los Angeles counties). (Map 65.)

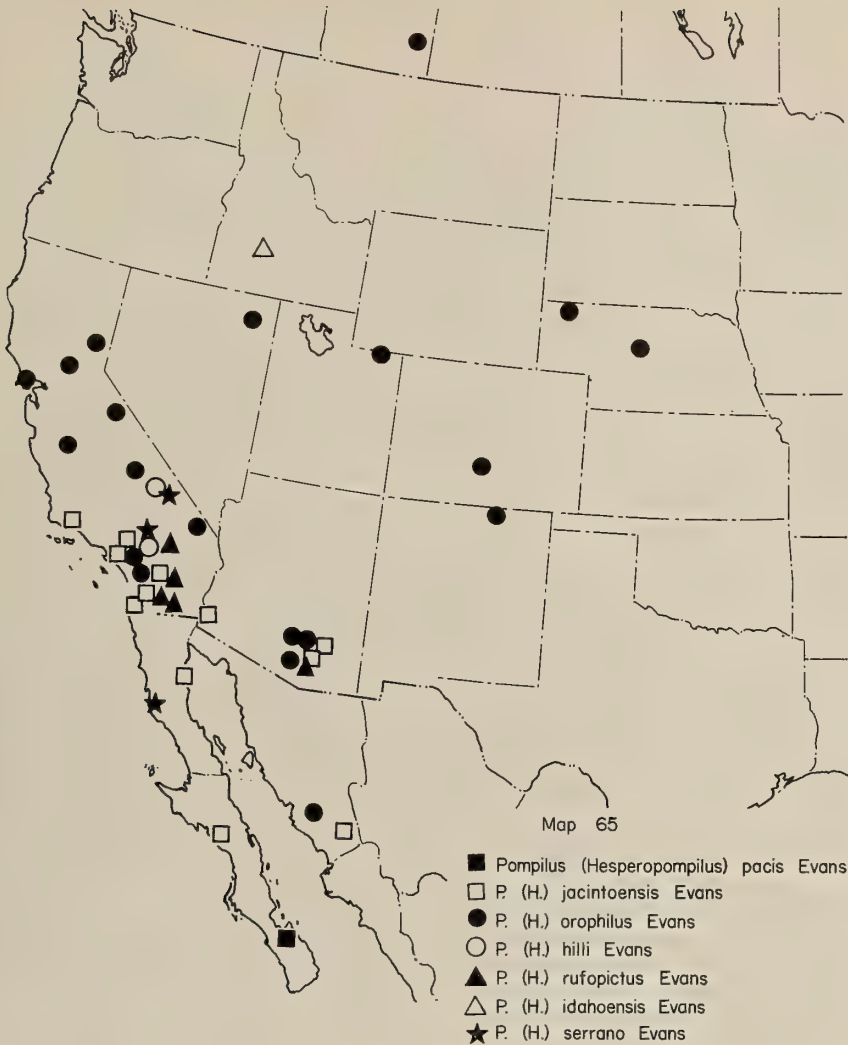
Specimens seen. — 1 ♀, 2 ♂♂. CALIFORNIA: 1 ♀, 1 ♂, Inyo Co. (data as cited for plesiallotype) [CIS]; 1 ♂, Pomona Mts., Sept. [type, MCZ].

***Pompilus (Hesperopompilus) orophilus* Evans**

Pompilus orophilus Evans, 1947, Ent. News, 58: 14-16 [Type: ♀, NEW MEXICO: Raton, 7000 feet, 12 Aug. 1946 (HEE) (MCZ, no. 27, 660)].

Pompilus (Hesperopompilus) orophilus Evans, 1948, Proc. Ent. Soc. Wash., 50: 148-149. — Evans, 1951, Trans. Amer. Ent. Soc., 77: 214-216.

Female. — Length 6.5-9 mm. Black; pubescence a brilliant deep blue or blue-green; fore wings moderately infuscated, darker along outer margin, somewhat violaceous; hind wings subhyaline except infuscated toward the apex. Head with unusually abundant dark setae; prothorax slightly hairy, but remainder of body smooth and devoid of setae except for a few weak ones on the abdomen toward the apex. Clypeus 2.3-2.4 X as wide as high, truncate below. Front very narrow, barely wider than the two eyes together, MID .50-.54 X TFD; UID subequal to or slightly less than LID. Ocelli in a rather large tri-



angle on the narrow vertex, POL much greater than OOL (about 3:2 in most specimens). Third antennal segment from .92 to 1.05 X UID. Pronotum short, subarcuate or broadly, weakly angulate behind; postnotum nearly as long as metanotum; propodeum with the slope rather low and even, with a weak posterior declivity. Front basitarsus with three (rarely four) slender comb-spines, the apical one about as long as the second segment. Pulvillar comb of about nine weak, diverging setulae. Fore wing with the marginal cell short, nearly or fully twice its own length from wing tip; SMC2 usually broader than

high, but SMC3 higher than broad in most specimens, narrowed by about half above.

Male. — Length 5-7 mm. Black, except posterior margin of pronotum with a pale yellowish stripe, interrupted medially; pubescence strongly bluish or violaceous except silvery on much of the head and pronotum, posterior part of mesoscutum, sides of scutellum, metanotum, pleura, coxae, propodeum (where the pubescence is very coarse), and basal bands on the first three tergites; wings hyaline, with a fuscous marginal band. Clypeus 1.8 X as wide as high, rounded below. MID .58-.61 X TFD; UID considerably exceeding LID; POL considerably exceeding OOL. Third antennal segment about twice as long as thick, slightly shorter than fourth segment. Postnotum about one third the length of the metanotum. Venation similar to that of female. SGP very slender, gradually tapering to an apical point, its margins fringed with setae, the basal appendages strong. Genitalia with the parameres slender, slightly exceeding the digiti, the latter somewhat capitate and with a few apical setae but none on the disc; basal hooklets present; aedoeagus much exceeding the rather short parameres (see figs. 174 and 203 in Evans, 1951).

Distribution. — The known range extends from southern California, Sonora, and New Mexico to Nebraska and Alberta. (Map 65.)

Specimens examined. — 13 ♀♀, 8 ♂♂. SONORA: 1 ♀, Cocorit, 14 Mch. 1962 (LS & FDP) [UCD]. CALIFORNIA: 1 ♀, 1 mi. N Alpine Lake, Marin Co., Sept. 1961 (E. P. Catts) [CIS]; 1 ♂, Davis, 13 Aug. 1955 (RMB) [UCD]; 1 ♂, Donner Pass, Nevada Co., 3 Aug. 1962 [MCZ]; 1 ♂, Idria, San Benito Co., 14 June 1955 [CIS]; 1 ♂, 11 mi. N Bridgeport, Mono Co., 7 July 1961 (RBM) [UCD]; 1 ♂, Antelope Spr., Inyo Co., 22 June 1960 (H. Court) [UCD]; 1 ♀, Crystal Lake, Los Angeles Co., 29 June [CIS]; 1 ♀, Monrovia, Los Angeles Co., 15 Aug. [MCZ]; 1 ♀, Los Angeles Co. (Coquillett) [USNM]; 1 ♂, 12 mi. S Ivanpah, San Bernardino Co., 1 May 1956 (PDH) [CIS]; 1 ♀, Elsinore, Riverside Co., 24 Aug. 1962 (HEE) [MCZ]. NEVADA: 1 ♀, Wells, 19 Aug. 1939 (A. Blanton) [CU]. ARIZONA: 1 ♂, Sacaton, Pinal Co., 6 Oct. 1959 (C. Benson) [UA]; 1 ♀, Baboquivari Mts., 19 July [KU]; 1 ♀, Santa Catalina Mts., 13 July [CIS]. NEW MEXICO: 1 ♀, Raton, 12 Aug. [type, MCZ]. UTAH: 1 ♀, Manila, 20 July 1962 (M. Esmaili) [MCZ]. COLORADO: 1 ♀, Texas Creek, 18 Sept. 1917 (R. C. Shannon) [CU]. NEBRASKA: 1 ♀, Halsey, 22 July 1957 (R. Henzlik) [MCZ]. ALBERTA: 1 ♂, Medicine Hat, 5 July [CNC].

Pompilus (Hesperopompilus) idahoensis new species

Holotype. — ♀, IDAHO: 3 mi. S Gooding, 9 May 1958 (W. F. Barr) [CAS].

Description of female type. — Length 8.7 mm.; fore wing 5.7 mm. Head and thorax black, except mandibles and apical margin of clypeus ferruginous; abdomen wholly bright ferruginous except base of first segment black; hind femora and tibiae ferruginous, the middle tibiae also suffused with dark ferruginous; wings subhyaline except broadly infuscated along the apical margin. Pubescence conspicuously silvery over most of the body and legs, except brownish on the vertex and parts of the thoracic dorsum. Temples and propleura with pale hairs, the front with a very few weak hairs; body otherwise without erect setae except for a few at the tip of the abdomen. Clypeus 2.4 X as wide as high, evenly rounded apically, the margin slightly elevated and polished. Front broad, MID .61 X TFD; UID .91 X LID. Vertex forming an even arc above the eye tops; POL and OOL equal. Antennae slender, first four segments in a ratio of 16:7:24:20, segment three equal to .68 X UID. Pronotum relatively long, its posterior margin nearly straight, with a very weak median angulation. Postnotum a narrow band only one fourth the length of the metanotum. Median line of propodeum strongly impressed; slope rather high, with a slightly concave declivity on the posterior third. Front basitarsus with three slender comb-spines, the apical one about as long as the second segment. Pulvillar comb very weak; claws very weakly dentate. Hind wing with the anal vein meeting media well basad of the origin of the cubitus; fore wing with the transverse median vein meeting media slightly beyond the origin of the basal vein; marginal cell removed from wing tip by 1.1 X its own length; SMC2 1.3 X as wide as high; SMC3 of the same maximum width and height, but more strongly narrowed above (by about half), the third intercubital vein forming a gentle curve.

Remarks. — There can be no doubt of the close relationship of this species to the one which follows, but this is a larger species with a considerably broader front and vertex. The claws are unusually weakly dentate, in fact almost without teeth. Only the type is known. (Map 65.)

Pompilus (Hesperopompilus) rufopictus Evans

Pompilus (Hesperopompilus) rufopictus Evans, 1948, Proc. Ent. Soc. Wash., 50: 144-146 [Type: ♀, CALIFORNIA: Dos Palmas, Riverside Co., 8 May 1932 (RMB & GEB) (CAS, no. 5951)]. — Evans, 1951, Trans. Amer. Ent. Soc., 77: 211-212.

Pompilus (Hesperopompilus) boharti Evans, 1951, Trans. Amer. Ent. Soc., 77: 216-217 [Type: ♂, CALIFORNIA: San Diego Co., Borrego, 5 April 1940 (RMB) (CAS)]. New synonym.

I stated in 1951 that I thought it unlikely that *boharti* was the male of *rufopictus*, but now that several additional specimens are known, as well as both sexes of the closely related species *serrano*, I feel that this association is highly probable.

Female. — Length 6-7 mm. Head and thorax black, except mandibles and lower part of clypeus dull ferruginous; abdomen bright rufo-ferruginous except blackish at extreme base and apex; hind femora and tibiae ferruginous except at the joints, the legs otherwise somewhat brownish; wings subhyaline, with a fuscous band along the outer margin. Entire body clothed with pale pubescence, which is more coarse and conspicuously silvery on the head, anterior slope and posterior margin of pronotum, sides of scutellum, metanotum, posterior part of propodeum, and hind coxae above. Body virtually devoid of erect hairs except for a few on the head, prothorax, and tip of the abdomen. Clypeus 2.5 X as wide as high, rounded apically. Front of moderate breadth, MID .56-.60 X TFD; UID slightly less than LID; POL slightly exceeding OOL. Antennae slender, third segment .70-1.0 X UID. Pronotum rather long, subarcuate behind. Slope of the propodeum low, slightly steepened behind; median line distinctly impressed. Front basitarsus with three comb-spines, the apical one about as long as the second tarsal segment. Pulvillar comb weak; claws weakly dentate. Fore wing with the stigma short, the marginal cell rather long, 1.0-1.2 X its own length from the wing tip; SMC2 nearly or quite twice as broad as high, SMC3 about as broad as high, narrowed by about two-thirds above.

Male. — Length 3.5-5 mm. Black; wings hyaline, fore wing with a fuscous marginal band. Pubescence silvery over much of the head, thorax, coxae, and base of the abdomen, brownish on parts of the thoracic dorsum and most of the legs and abdomen. Body without erect hairs except for a few inconspicuous ones on the head and thorax. Clypeus about 1.7 X as wide as high, rounded below. Head subcircular in anterior view, the vertex broad, raised in an even arc above the eye tops. MID .63-.68 X TFD; eyes strongly divergent above, UID 1.25-1.3 X LID; ocelli small and widely spaced, POL slightly exceeding OOL. Third antennal segment 1.3-1.5 X as long as wide, much shorter than fourth segment. Pronotum rather long, arcuate behind; postnotum short, about one-third the length of the metanotum; propodeum rather abruptly declivous on the posterior fourth. Venation similar to that of female, including the broad SMC2, but the available specimens with the marginal cell rather pointed and removed from the wing tip by slightly less than its own length. SGP rather narrow, tapering to a narrowly rounded apex, basal appendages well developed (almost exactly as figured for the following species). Genitalia with the parameres short, rod-like; digiti exceeding the parameres and bearing several strong apical setae; basal hooklets wanting; parapenial lobes and aedoeagus slightly exceeding the digiti (see fig. 176 in Evans, 1951).

Distribution. — Deserts of southern California and Arizona. (Map 65.)

Specimens seen. — 4 ♀♀, 3 ♂♂. CALIFORNIA: 1 ♂, Cronise Valley, San Bernardino Co., 29 April 1956 (PDH, on *Prosopis*) [CIS]; 1 ♀, Dos Palmas, Riverside Co., 8 May 1932 (RMB & GEB) [CAS]; 1 ♀, 1 ♂, Borrego, San Diego Co., 5-19 April (RMB, EIS) [CAS, CIS]; 1 ♂, Fish Creek Mts., Imperial Co., 20 April 1935 (W. R. Richards) [CNC]. ARIZONA: 2 ♀♀, Tucson, May, June 1961 (S. Johnson; ethylene glycol pollen traps) [UA].

Pompilus (Hesperopompilus) serrano new species

Holotype. — ♀, MEXICO: BAJA CALIFORNIA: Km. 220 S Tijuana, 10 Sept. 1955 (FXW; on Australian salt bush) [CAS].

Description of type female. — Length 5.8 mm; fore wing 4.8 mm. Head and thorax black, except mandibles and apical part of clypeus pale ferruginous, and pronotum whitish on the collar and in a narrow band along the posterior margin, narrowly interrupted medially; abdomen wholly bright rufo-ferruginous; hind femora and tibiae dull ferruginous except dark at joints, middle femora and tibiae brownish, legs otherwise fuscous; fore wing lightly infuscated, except broadly darker apically; hind wing subhyaline, darker at the tip. Pubescence silvery over much of the body, brownish on the vertex, parts of the thoracic dorsum, and sides of the propodeum; head, prothorax, and tip of abdomen with a few weak setae, the body otherwise without erect setae. Clypeus 2.5 X as wide as high, its apical margin subtruncate, actually slightly convex, the margin slightly elevated and polished. Head subcircular in anterior view, the vertex raised in a smooth arc above the eye tops. Front moderately broad, MID .59 X TFD; UID .95 X LID; POL:OOL=7:9. First four antennal segments in a ratio of about 15:6:21:20, segment three .74 X UID. Pronotum rather long, its posterior margin arcuate and with a weak median notch; postnotum on the midline about a third the length of the metanotum; propodeum lightly impressed medially, its slope very low, with an oblique declivity on the posterior third. Front basitarsus with three comb-spines, the apical one only half the length of the second segment, the basal one very small. Pulvillar pad and comb weakly developed; claws dentate. Hind wing with the anal vein meeting the median vein well basad of the origin of cubitus; fore wing with the transverse median vein meeting media well beyond the origin of the basal vein; marginal cell removed from tip of wing by nearly twice its own length; SMC2 1.8 X as wide as high, narrowed by slightly more than half above, receiving both recurrent veins; SMC3 absent.

Allotype. — ♂, CALIFORNIA: Helendale, San Bernardino Co., 27 May 1955 (W. R. M. Mason) [CNC].

Description of allotype male. — Length 4.5 mm.; fore wing 3.7 mm. Head and thorax black except mandibles rufo-testaceous apically and pronotum with a whitish stripe along the posterior margin, narrowly interrupted medially; abdomen brownish-fuscous except encircled with orange-brown on second segment, apex of first, and basal two-thirds of third; legs fuscous; wings subhyaline except fore wing lightly infuscated on apical fourth. Pubescence extensively silvery, brownish on parts of thoracic dorsum and on legs except silvery on parts of the coxae and femora; body virtually devoid of erect hairs except for a few on the upper front and some pale hairs on the temples and propleura. Front subcircular in anterior view; vertex strongly arched above eye-tops; clypeus 1.7 X as wide as high, rounded below except subtruncate at extreme apex. Front broad, MID .65 X TFD; inner orbits diverging strongly above, UID 1.35 X LID; POL:OOL=9:10. First four antennal segments in a ratio of about 10:5:6:8, segment three only 1.25 X as long as wide. Pronotum rather long, subarcuate behind; postnotum at the midline about half as long as metanotum; propodeum with a median basal impression. Legs slender and not strongly spinose; longer spur of hind tibia .8 the length of the basitarsus. Wings as in female, except marginal cell relatively slightly longer, removed from wing tip by only about 1.5 X its own length; SMC2 also longer, about twice as long as high, narrowed by approximately half above. Abdomen very slender; S4 and 5 slightly emarginate behind, S6 with a strong, U-shaped emargination. SGP tapering to a narrowly rounded apex, the basal appendages elongate (fig. 83). Genitalia with the parameres short, rod-like, much exceeded by the digits; basal hooklets strong; aedoeagus very slender, slightly exceeded by the stout parapepial lobes (fig. 58).

Distribution. — Southern California and northern Baja California. (Map 65.)

Paratypes. — BAJA CALIFORNIA: 2 ♀♀, same data as type [CAS, MCZ]; CALIFORNIA: 1 ♀, Surprise Canyon, Inyo Co., 5 May 1961 (P. M. Marsh) [UCD].

Variation. — The paratypes measure 5 to 6 mm. and resemble the type closely in color of body and integument. MID varies from .59 to .61 X TFD, UID from .95 to 1.0 X LID; the third antennal segment varies from .65 to .73 X UID. In one specimen the second intercubital vein has a short stub arising from it, presumably a vestige of the third intercubital. In the California females the middle legs are black.

Subgenus **XENOPOMPILUS** Evans

Xenopompilus Evans, 1953, Ann. Ent. Soc. Amer., 46: 531-537 [Type species: *Pompilus (Xenopompilus) tlahuicanus* Evans, original designation]

(proposed as subgenus of *Pompilus*). — Evans, 1960, Ent. News, 71: 165-169.

Subgeneric characters. — Length 3.5-10 mm.; known species black, males with apical tergite white. Female with or without some dark setae on the propodeum, male with coarse, suberect whitish pile on the propodeum; female with a few weak setae at the apex of the abdomen and some short, suberect setae on the inner side of the antennal flagellum. Front, in both sexes, rather prominent above the antennal sockets, sloping steeply between the sockets, the face below the sockets on a much lower plane than the front above. Pronotum arcuate or obtusely angulate behind; scutellum very prominent; postnotum broadened medially, in the male nearly as broad medially as the metanotum; slope of propodeum sometimes with weak transverse rugae in female. Legs rather weakly spinose, front tarsus of female without a comb. Apical tarsal segments not spined beneath; pulvillar pad and comb weakly developed. Last segment of front tarsus of male unmodified, symmetrical, inner claw of this tarsus strongly curved, bifid, outer claw a little more curved than those of the remaining tarsi, sub-bifid. Fore wing with three SMCs, the radial vein somewhat angled at the third intercubital vein; hind wing with the anal vein meeting media well before the origin of the cubitus. Male SGP simple, without basal appendages. Genitalia with the parameres exceedingly short, club-like; digiti and other appendages much exceeding the parameres; basal hooklets absent; aedoeagus simple, slender, elongate.

Distribution. — Central Mexico (Morelos, Puebla) north through western Mexico to southern Arizona.

Remarks. — Only two species of this subgenus are known. Since I have already treated the group twice, I shall cover it only briefly here.

Key to Species

- Labrum barely if at all exerted; thoracic dorsum with only a few short, inconspicuous setae; front femora of female not incrassate; third antennal segment of female slightly longer than fourth, equal to from .64 to .80 X UID; male SGP moderately broad, margined with weak setae *tlahuicanus* Evans
- Labrum well exerted beyond apical margin of clypeus; thoracic dorsum with numerous strong, dark setae in both sexes; front femora of female slightly incrassate; third antennal segment of female not longer than fourth, equal to from .55 to .63 X UID; male SGP slender, its margin fringed with stout setae *tarascanus* Evans

***Pompilus (Xenopompilus) tlahuicanus* Evans**

Pompilus (Xenopompilus) tlahuicanus Evans, 1953, Ann. Ent. Soc. Amer., 46: 534-535 [Type: ♀, MEXICO: MORELOS: Alpuyeca, 27 June 1951 (PDH) (CAS)]. — Evans, 1960, Ent. News, 71: 166-167.

Pompilus (Xenopompilus) tarahumarae Evans, 1953, op. cit., pp. 535-536 [Type: ♀, MEXICO: DURANGO: 10 km. N Nombre de Dios, 5 Aug. 1951 (HEE) (USNM, no. 61, 742)]. Synonymy by Evans, 1960.

Female. — Length 6.5-9.5 mm. Black, the pubescence strongly reflecting bluish; fore wings moderately infuscated, darker along outer margin, with strong bluish reflections; hind wings nearly hyaline, darker along outer margin. Head and prothorax with erect setae in moderate abundance, the mesonotum with a few, but the propodeum without erect setae. Labrum not or scarcely exerted; clypeus about 2.7 X as wide as high, its margin with a narrowly elevated rim. Front of moderate width, MID .54-.57 X TFD; UID .85-.95 X LID; vertex elevated in a slight arc above the eye tops; POL:OOL about as 4:3. Third antennal segment shorter than the first two together, but slightly longer than fourth segment, measuring from .64 to .80 X UID. Propodeum weakly transversely rugulose on the sides of the declivity. Front femora not incrassate, measuring 3.7 to 4.0 X as long as wide.

Male. — Length 3.8-7.8 mm. Black; pubescence silvery over most of the body; wings hyaline, fore wing infuscated along outer margin, the infuscation varying from fairly dark to almost absent. Clypeus about twice as broad as high, truncate or weakly rounded below. Front of moderate breadth, MID .59-.64 X TFD; eyes strongly diverging above, UID slightly less than MID, 1.20-1.35 X LID; ocelli in a broad triangle, POL:OOL about as 5:4. Third antennal segment shorter than fourth segment, measuring 1.4-1.7 X as long as thick. Third SMC much narrowed above, often triangular, occasionally short-petiolate. SGP moderately broad, tapering evenly to a narrowly rounded apex. Genitalia with the parameres bearing some long, slender setae on their inner margin; digiti clothed with minute setae; parapenial lobes with an angulation on the inner margin (see fig. 1 in Evans, 1953).

Distribution. — Puebla and Morelos to Arizona, chiefly in open, semiarid country. (Map 66.)

Specimens examined. — 26 ♀♀, 30 ♂♂. PUEBLA: 1 ♂, Cacaolapan, 26 Apr. 1962 (FDP) [UCD]. MORELOS: 15 ♀♀, 22 ♂♂, Alpuyeca & vic., about 3000 feet elevation, May, June (HEE, PDH) [MCZ, CU, CIS, USNM, ENAC, CAS]; 7 ♀♀, 5 ♂♂, Cuernavaca & vic., 4000-6500 feet, Mch., Apr., June (HEE, LS) [CU, UCD, MCZ]. JALISCO: 2 ♀♀, Guadalajara, 13 July 1959, 5000 feet (HEE) [MCZ]. DURANGO: 1 ♀, 10 km. N Nombre de Dios, 5 Aug. 1951 (HEE) [USNM]. CHIHUAHUA: 1 ♀, 25 km. S Chihuahua, 11 Aug. 1951 (HEE) [MCZ]. ARIZONA: 2 ♂♂, 5 mi. W Portal, Co-



chise Co., 5400 feet, 9-12 Sept. 1959 (HEE) [CU, MCZ].

***Pompilus (Xenopompilus) tarascanus* Evans**

Pompilus (Xenopompilus) tarascanus Evans, 1953, Ann. Ent. Soc. Amer., 46: 536-537 [Type: ♀, MEXICO: MICHOACAN: 5 km. W Zacapu, 13 July 1951 (PDH) (CAS)]. — Evans, 1960, Ent. News, 71: 167-168 (♂ described).

Female. — Length 5.5-8.0 mm. Black, the pubescence strongly bluish; wings moderately infuscated, darker along outer margin, violaceous. Head with abundant dark, erect setae; thoracic dorsum with sparse, dark setae; propodeum with a few erect setae on each side. Labrum well exerted beyond margin of clypeus, the latter nearly straight, without an elevated rim; clypeus 2.2 X as broad as high. Malar space fairly well developed, half the length of the pedicel. MID .56-.63 X TFD; UID subequal to or slightly less than LID; POL slightly greater than OOL in most specimens, but the reverse sometimes true. Third antennal segment much shorter than the first two together, not longer than the fourth segment, measuring from .55 to .63 X UID. Propodeum without transverse rugae. Front femora slightly incrassate, measuring about or slightly more than 3 X as long as wide.

Male. — Length 4.5-6.2 mm. Black; pubescence extensively silvery, but dark bluish on vertex, parts of the thoracic dorsum, sides of the propodeum, and abdomen; wings hyaline, fore wing with a narrow fuscous band apically. Head and thoracic dorsum with numerous dark setae. Labrum well exerted;

clypeus about twice as broad as high. Third antennal segment shorter than fourth, only about 1.3 X as long as wide. Eyes slightly divergent above; POL slightly exceeding OOL. Third SMC small, triangular or nearly so, in one specimen short-petiolate. SGP narrow, tapering to an acute apex, its margin with stout spines. Genitalia with both the parameres and digiti clothed with heavy, dark setae (see figs. 1 and 2 in Evans, 1960).

Distribution. — Highlands of central Mexico: Michoacan, Morelos, and state of Mexico. (Map 66.)

Specimens examined. — 6 ♀ ♀, 6 ♂ ♂. MICHUACAN: 1 ♀, 5 km. W Zacapu, 13 July 1951 (PDH) [CAS]. MORELOS: 1 ♀, Cuernavaca, 16 May 1959, 5500 feet (M. A. Evans) [MCZ]. MEXICO: 4 ♀ ♀, 6 ♂ ♂, Teotihuacan Pyramids, June, July, 7500 feet (HEE) [CU, MCZ, USNM].

Subgenus **PERISSOPOMPILUS** Evans

Perissopompilus Evans, 1951, Trans. Amer. Ent. Soc., 77: 222-226 [Type species: *Pompilus phoenix* Evans, original designation] (described as subgenus of *Pompilus*). — Evans, 1953, Ann. Ent. Soc. Amer., 46: 531 (Mexican records).

Subgeneric characters. — Length 3-11 mm. Known species entirely black, often with heavy silvery pubescence; body without erect setae on the propodeum or on the abdomen, even at the apex. Clypeus truncate below. Front and vertex rather dull, the surface minutely granulopunctate; line from the antennal bases to the front ocellus deeply impressed. Third antennal segment in female somewhat longer than fourth segment, in the male shorter than the fourth segment, 1.2-2.1 X as long as thick. Pronotum arcuate to angulate behind; postnotum as long as or nearly as long as metanotum medially. Front basitarsus of female short, not over 5 X as long as wide, with only two small comb-spines; apical tarsal segments smooth beneath or with from one to three minute spines on the basal half. Last segment of front tarsus of male slender, unmodified, the inner claw of this tarsus moderately curved, bifid, all other claws dentate. Pulvillar pad and comb very small. Fore wing with the marginal cell short, removed from tip of wing by at least 1.5 X its own length; SMC3 very small, triangular, or in one species entirely absent (fig. 21). Male with S6 bearing a pair of weak to strong longitudinal carinae; SGP simple, without basal appendages. Male genitalia with the parameres straight, rod-like, shorter than the digiti, the latter simple and bearing short setae; basal hooklets double; parapenial lobes stout, blunt apically; aedoeagus with an apical expansion.

Distribution. — Deserts and semiarid plains, central Mexico to California, Utah, and western Texas.

Key to Species

- Fore wing with a small third SMC;²⁸ body of female with a limited pattern of silvery pubescence (or none at all), the mesopleura without silvery pubescence; ultimate segments of middle and hind tarsi of female with from one to three minute spines; parameres of male genitalia very slender, the aedeagus with a conspicuous apical expansion *phoenix* Evans
- Fore wing only two SMCs; both sexes extensively clothed with coarse silvery pubescence, including the mesopleura; ultimate tarsal segments completely without spines beneath; parameres of male genitalia somewhat stouter, the aedeagus with only a weak apical expansion *perfasciatus* Evans

***Pompilus (Perissopompilus) phoenix* Evans**

Pompilus (Ammosphex) phoenix Evans, 1948, Pan-Pac. Ent., 24: 123-127 [Type: ♂, ARIZONA: Phoenix, 11 July 1932 (CAS, no. 5952)].

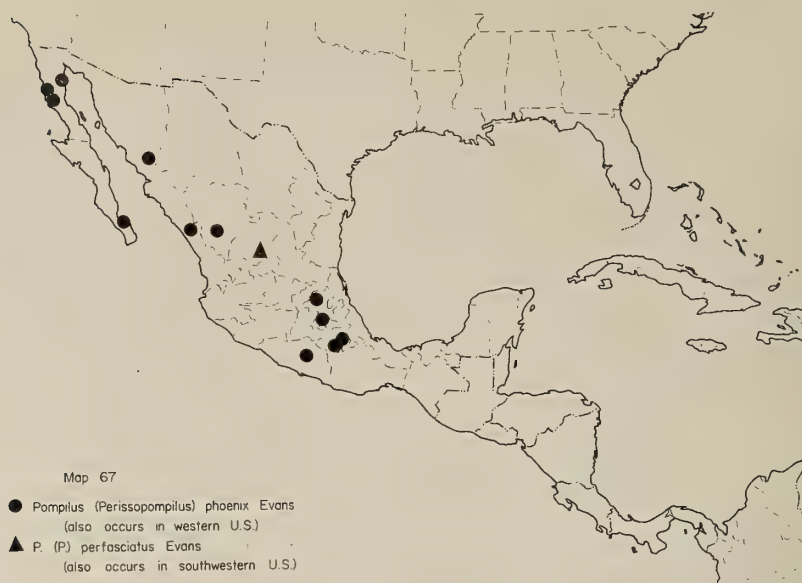
Pompilus (Perissopompilus) phoenix Evans, 1951, Trans. Amer. Ent. Soc., 77: 223-225. — Evans, 1953, Ann. Ent. Soc. Amer., 46: 531 (Mexican records).

Female. — Length 5.0-10.5 mm. Black; fore wings moderately infuscated, darker along outer margin, violaceous; hind wings subhyaline, darker at apex. Pubescence dark, occasionally wholly so, but often silvery on parts of the head and thorax and with apical silvery bands on the basal abdominal tergites. Clypeus about 3 X as broad as high, truncate below. Front of rather variable width, MID from .45 to .57 X TFD; UID from .80 to .90 X LID; POL:OOL about as 4:3. Third antennal segment equal to from .65 to 1.0 X UID. Spines of tarsal comb from 1 to 2 X as long as width of tarsus. Fore wing with three SMCs, the third small, often petiolate.

Male. — Length 3.5-7.0 mm. Black; wings hyaline, with a dark outer marginal band; head and thorax strongly patterned with coarse silvery pubescence, basal abdominal tergites also with strong apical bands of silvery pubescence. Head rather broad, the eyes large; MID varying from .50 to .60 X TFD; UID much exceeding LID; POL:OOL about as 4:3. Third antennal segment from 1.3 to 2.0 X as long as thick. SMC3 nearly always petiolate. S6 with a median area set off by carinae; SGP obtusely angulate apically; genitalia as figured by Evans, 1951, fig. 177.

Distribution. — Open, semiarid country, from Puebla and Guerrero to California, Nevada, Utah, and western Texas. See Evans, 1951, for U. S. records. The Nevada record is based on a male from Eastgate, Churchill Co. [CIS] and on a female from Nixon, Washoe Co. [UCD]. (Map 67.)

²⁸ I have seen one specimen of *phoenix* (a male from Davis, California) with only two SMCs in one wing, three in the other (but the third extremely small).



Mexican specimens examined. — 11 ♀♀, 13 ♂♂. BAJA CALIFORNIA: 1 ♂, San Felipe, 20 Feb. 1954 (P. H. Arnaud) [MSU]; 1 ♀, 10 mi. E Bahia San Quintin, 10 Sept. 1955 (FXW) [CAS]; 1 ♂, Km. 220 S Tijuana, 10 Sept. 1955 (FXW) [CAS]; 1 ♂, La Paz, 7 Oct. 1955 (FXW) [CAS]. SONORA: 2 ♂♂, La Aduana, 22 May 1962 (FDP, LS) [UCD]. SINALOA: 1 ♂, 8 mi. SE Elota, 19 May 1962 (FDP) [UCD]. DURANGO: 1 ♂, 10 mi. W Durango, 12 July 1954 (EIS) [CIS]. HIDALGO: 2 ♀♀, Zimapán, 11-14 June 1951 (HEE, PDH) [MCZ, CIS]. MEXICO: 3 ♀♀, 2 ♂♂, Teotihuacan Pyramids, 7500 feet, June, July (PDH, HEE) [CIS, MCZ, CU]. PUEBLA: 2 ♀♀, 3 ♂♂, Tehuacan, 23 June 1951 (HEE, PDH) [MCZ, CIS]; 2 ♀♀, 1 ♂, 3 mi. NW Petlalcingo, 3 Apr. 1962 (FDP) [UCD]. GUERRERO: 1 ♀, 3 mi. N Chilpancingo, 19 March 1959, 4000 feet (HEE) [CU].

***Pompilus (Perissopompilus) perfasciatus* Evans**

Pompilus (Perissopompilus) perfasciatus Evans, 1951, Trans. Amer. Ent. Soc., 77: 225-226 [Type: ♀, CALIFORNIA: Whitewater, Riverside Co., 9 July 1950 (JWM) (CAS)]. — Evans, 1958, Ent. News, 69: 147-148, 151 (description of male).

Female. — Length 4.5-7.0 mm. Black; fore wings clear hyaline to moderately infuscated on the basal three-fourths, with a strong darker band on the apical fourth; hind wings hyaline or lightly infuscated, darker apically. Body clothed extensively with a coarse silvery pubescence, absent from the vertex, parts of the thoracic dorsum, and the metapleura; abdomen more or less banded with silvery pubescence. Clypeus 3.4-3.9 X as broad as high, truncate below. Front rather broad, MID .56-.61 X TFD; UID .85-.90 X LID; POL:OOL about as 5:3. Third antennal segment equal to from .45 to .58 X UID. Front basitarsus short and with the comb-spines nearly or quite half the length of the basitarsus. Fore wing with only two SMCs.

Male. — Length 3.5-4.5 mm. Black; wings hyaline, with a brownish band on the apical fourth of the fore wing; body clothed with a coarse silvery pubescence, especially prominent on the temples, posterior margin of pronotum, mesopleura, and hind coxae; pubescence on abdominal tergites directed backward except in broad apical bands, where it tends to diverge from the median line. Head broad; eyes diverging above; POL:OOL about as 8:5. Third antennal segment no longer than the second, not or barely longer than thick. Wings as in female. S6 with a pair of weak carinae, by no means as strong as in *phoenix*. Terminalia as figured by Evans, 1958, figs. 1 and 2, differing from those of *phoenix* as expressed in the key.

Distribution. — Deserts of southern California and Arizona, with a single record from Zacatecas, Mexico. (Map 67.)

Specimens examined. — 10 ♀♀, 3 ♂♂. CALIFORNIA: 1 ♀, Whitewater, Riverside Co. [type, CAS]; 1 ♀, Indio, Riverside Co., Apr. (PDH) [CIS]; 1 ♀, Hopkins Well, Riverside Co., Apr. (E. G. Linsley) [CIS]; 1 ♀, 18 mi. W Blythe, Riverside Co., 2 Apr. 1963 (RMB) [UCD]; 3 ♀♀, 2 ♂♂, Borrego Valley dunes, San Diego Co., Apr. (RMB) [UCD, MCZ]. ARIZONA: 1 ♂, 15 mi. NE Yuma, Apr. (RHP) [MCZ]; 1 ♀, 8.3 mi. E Yuma, Mch. (JWM) [CIS]; 1 ♀, 21 mi. N Yuma, 4 Apr. 1963 (FDP) [UCD]. MEXICO: ZACATECAS: 1 ♀, 9 mi. N Ojo Caliente, 12 May 1962 (FDP) [UCD].

Variation. — The Zacatecas specimen has the wings moderately infuscated instead of hyaline as in the U. S. specimens, the apical fuscous band thus contrasting less strongly to the base; also the abdomen is mostly dark-pubescent except for strong apical silvery bands on T1-4.

Subgenus XEROCHARES Evans

Xerochares Evans, 1951, Trans. Amer. Ent. Soc., 77: 218-221 [Type species: *Pompilus expulsus* Schulz, original designation] (proposed as subgenus of *Pompilus*). — Evans, 1953, Ann. Ent. Soc. Amer., 46: 529.

Subgeneric characters. — Length 9-17 mm. Temples, propleura, front coxae, mesopleura, and propodeum with abundant white hair. Clypeus truncate below. Head thin, the temples not well developed; malar space fairly long in male; head of male somewhat triangular in anterior view. Antennae slender, third segment in female longer than first two together and longer than fourth, third segment in male about as long as fourth segment. Pronotum arcuate behind; postnotum a narrow transverse band. Front basitarsus of female with three long, flattened comb-spines. Apical tarsal segments of female with from one to three strong spines beneath near the base. Last segment of front tarsus of male slender, unmodified, both claws of this tarsus bifid. Pulvillar comb strong, in the female with about 20 setulae. Fore wing with the stigma small; marginal cell about its own length from the wing tip; SMC3 strongly narrowed above. Male SGP without basal appendages. Male genitalia with the parameres very slender, curved, about as long as the slender digiti; basal hooklets strong, single; aedoeagus and parapenial lobes simple.

Distribution. — Deserts and semiarid plains, from Arizona to Guatemala.

Remarks. — This subgenus contains but one species.

***Pompilus (Xerochares) expulsus* Schulz**

Pompilus connexus Fox, 1893, Proc. Calif. Acad. Sci., (2)4: 23 [Type: ♀, BAJA CALIFORNIA: San José del Cabo (G. Eisen) (CAS, no. 238)] (preoccupied by Cresson, 1869).

Pompilus expulsus Schulz, 1906, Spolia Hymen., p. 170 (n. name).

Psammochaeres arizonica Banks, 1910, Jour. N. Y. Ent. Soc., 18: 115 [Type: ♀, ARIZONA: Palmerlee, May (MCZ, no. 13, 692)].

Pompilus rubriventris Bradley, 1944, Notulae Nat., Acad. Nat. Sci. Phila., no. 145, p. 9 (n. name for *connexus* Fox).

Pompilus (Xerochaeres) expulsus Evans, 1951, Trans. Amer. Ent. Soc., 77: 219-221. — Evans, 1953, Ann. Ent. Soc. Amer., 46: 529.

Female. — Length 11.5-17 mm. Head and thorax black, abdomen bright rufo-ferruginous; wings lightly infuscated, with a darker marginal band. Body and legs clothed with a heavy, grayish-glaucous pubescence, replaced by dark pubescence in a stripe across the vertex, parts of the thoracic dorsum, and a band across the propodeum near its base. Upper front and vertex, also the clypeus and part of the pronotum, with some dark hairs, the head, thorax, and propodeum otherwise with whitish hairs; abdomen with strong dark setae at the apex. Clypeus 2.4-2.5 X as wide as high; MID .58-.61 X TFD; UID .80-.92 X LID; POL usually slightly less than OOL. Third antennal segment equal to .85-.95 X UID. Apical comb-spine of front basitarsus considerably longer than second tarsal segment.

Male. — Length 9-13.5 mm. Coloration of body, wings, and pubescence

essentially as in female, except the posterior margin of the pronotum with a pale yellowish stripe. Erect hairs as in female except the abdomen with only some short, weak setae. Clypeus 1.9-2.1 X as wide as high. Head about 1.25 X as wide as high; MID .58-.62 X TFD; eyes divergent to well above the middle, then convergent at the top, UID usually measuring slightly greater than LID. POL:OOL about as 2:3. Third antennal segment 2.0-2.4 X as long as thick. SGP of moderate breadth, somewhat raised along the median line, the apex narrowly truncate. Genitalia as described under the subgeneric heading and as figured by Evans, 1951, fig. 172.

Distribution. — Southern New Mexico and Arizona to Baja California and south through arid and semiarid parts of western Mexico to Guatemala. For Arizona records, see Evans, 1951. The New Mexico record is new and is based on a ♀ in the USNM from Las Cruces, May-June 1961 (L. D. Robberson). (Map 62.)

Mexican and Guatemalan specimens examined. — 6 ♀ ♀, 17 ♂ ♂. BAJA CALIFORNIA: 2 ♂ ♂, 21 mi. N Mesquital, 27 Sept. 1941 (ESR & GEB) [CAS]; 1 ♀, Angeles Bay, Gulf of California, 27 June (E. P. VanDuzee) [CAS]; 2 ♂ ♂, La Paz, 3 June (VanDuzee) [CAS]; 2 ♀ ♀, San José del Cabo (G. Eisen) [ANSP, CAS]; 1 ♂, Cabo San Lucas, 16 Mch. 1953 (P. H. Arnaud) [CAS]; 1 ♂, 19.2 mi. W La Paz, 31 Dec. 1958 (HBL) [CAS]; 1 ♂, 9 mi. S Todos Santos, 14 Jan. 1959 (HBL) [CAS]. SONORA: 1 ♀, La Aduana, 22 May 1962 (FDP, LS) [UCD]. SINALOA: 1 ♀, 3 mi. N Elota, 18 Mch. 1962 (LS) [UCD]; 4 ♂ ♂, 8 mi. SE Elota, May, July (FDP) [UCD]. JALISCO: 1 ♂, Plan de Barrancas, 24 Mch. 1962 (FDP) [UCD]. MORELOS: 2 ♂ ♂, 3 mi. N Alpuyeca, 3400 feet, Apr., May 1959 (HEE) [MCZ, CU]; 1 ♂, 4 mi. E Cuernavaca, 25 June 1959 (HEE) [CU]; 1 ♂, 3 mi. NW Cuernavaca, 6500 feet, 26 June 1959 (HEE) [MCZ]. GUATEMALA: 1 ♀, Antigua, 8 Aug. 1951 (RHP) [MCZ]; 1 ♂, Yepocapa, July 1948 (H. T. Dalmat) [USNM].

Subgenus AMMOSPHEX Wilcke

Ammosphex Wilcke, 1942, Ent. Berichten, 11: 25 [Type species: *Pompilus unguicularis* Thomson, original designation]. — Evans, 1951, Trans. Amer. Ent. Soc., 77: 227-255 (U. S. spp.; subgenus of *Pompilus*). — Evans, 1953, Ann. Ent. Soc. Amer., 46: 537-543 (Mexican spp.).
Anopompilinus Dreisbach, 1949, Ent. Amer., 29: 7, 10, 11, 34 [Type species: *Anopompilinus michiganensis* Dreisbach, monobasic].

Subgeneric characters. — Length 3.5-12 mm.; black, the abdomen some-

times rufous (but not in the species considered here). Body with a variable amount of erect hair, the propodeum at most moderately hairy, the hairs dark when present. Malar space virtually absent; antennae elongate, segment three in the male at least twice as long as thick. Pronotum rather sharply angulate behind. Front tarsus of female with a comb of short or moderately long spines, the basitarsus bearing three comb-spines (but in *zapotecus* the tarsal comb is absent or virtually so). Apical tarsal segments of female with a more or less complete row of spines beneath. Last segment of front tarsus of male with a strong lobe on the inner margin, both claws of this tarsus bifid, the inner claw strongly curved. Pulvillar comb moderately well developed, in the female of about 12 setulae. Fore wing with the marginal cell short, at least 1.3 X its own length from the wing tip; SMC2 and 3 small, often higher than wide, much narrowed above. Genitalia with the basal hooklets double, the parameres elongate, generally exceeding all the other parts; parapenials shorter than the aedoeagus, the latter bearing a series of small denticles on its margin toward the apex.

Distribution. — This subgenus is mainly Holarctic in distribution. Several of the Nearctic species extend into the Mexican highlands, and the several endemic Mexican forms are closely related to and probably derived from species occurring in western United States. There are no records from south of Mexico, but I collected *angularis* *volcanicus* in good series in mountains less than 100 miles from the Guatemala border.

Remarks. — The members of this subgenus can be said to fall into three species-groups, here called the *angularis*, *solonus*, and *luctuosus* groups. Within each of these groups (especially the first two) the females are exceedingly difficult to separate, and the key presented below is by no means wholly satisfactory for this sex. In addition to covering the nine forms occurring in Mexico, I have included, at the end of the subgenus, the description of a new species of the *luctuosus* group from California. This species is not included in the keys, but characters are presented under that species which serve to separate it from other members of its complex.

Key to Species

Females

1. Propodeum with an abundance of long, dark setae; thoracic dorsum also with a number of strong setae; integument dark steel blue, overlaid with bluish pubescence (*luctuosus* group) *occidentalis* (Dreisbach)

- Propodeum not hairy or with a few weak hairs on the sides; thoracic dorsum very sparsely, weakly setose 2
2. Marginal cell removed from wing tip by 1.7-2.2 X its own length; body rather bluish; front and vertex rather narrow, third antennal segment .82-1.0 X UID (*solonus* group) 3
- Marginal cell small, removed from wing tip by 2.5-3.0 X its own length; body black, pubescence with rather obscure bluish reflections if any (*angularis* group) 4
3. Tarsal comb strongly developed; length 7.5-12 mm.; third antennal segment distinctly longer than first two combined *solonus solonus* (Banks) and *solonus teotihuacanus* Evans
- Tarsal comb absent, the second tarsal segment with a minute spine on the inner side near the middle or none at all; length 6-8 mm.; third antennal segment subequal to or very slightly longer than the first two together *zapotecus* Cameron
4. Third antennal segment equal to or very slightly longer than the first two together, equal to from .71-.92 X UID; front narrow, MID .53-.56 X TFD *parvulus* (Banks)
- Third antennal segment in most specimens very slightly shorter than the first two together, equal to from .60 to .78 X UID; MID .55-.61 X TFD 5
5. Comb-spines in most specimens measuring slightly longer than the width of the tarsus at their base; pubescence mostly if not entirely dark, occasionally cinereous or somewhat silvery on the lower front *otomi* Evans
- Comb-spines not longer than the width of the tarsus; pubescence usually silvery on the lower front, sometimes also on the temples, clypeus, and parts of the thorax *angularis angularis* (Banks) and *angularis volcanicus* Evans

Males

1. SGP nearly flat and with a subapical pencil of long setae; propodeum with some dark setae (*luctuosus* group) *occidentalis* (Dreisbach)
SGP without a long pencil of setae subapically, if with a short pencil or tuft then the disc elevated medially; propodeum not or barely hairy 2
2. Marginal cell removed from wing tip by less than 2.5 X its own length; SGP with a small tuft of setae subapically which usually stand above the surrounding setae; aedoeagus simple (*solonus* group) 3
Marginal cell removed from wing tip by more than 2.5 X its own length; SGP without such a tuft of setae which stand out above the others; aedoeagus with its margins sinuate so as to delimit three broadened portions along the shaft (*angularis* group) 5
3. SGP with a median carina, a row of partially erect setae along the carina and an inconspicuous subapical tuft; parameres broad (fig. 55)
..... *zapotecus* Cameron

- Median portion of SGP more broadly covered with bristling, almost fully erect setae, the subapical tuft conspicuous; parameres much more slender 4
4. Parameres slightly expanded on the apical half; major part of disc of SGP elevated and bristly *solonus solonus* (Banks)
Parameres very slender, linear; SGP rather narrowly elevated medially *solonus teotihuacanus* Evans
5. SGP slender and with the sides tapering evenly to a narrow, subacute apex; parameres with dense, bushy hairs apically 6
SGP broader and not tapering evenly to a subacute apex; parameres not bushy-haired apically 7
6. Parameres slender and attenuate apically, much exceeding the digiti *angularis angularis* (Banks)
Parameres broad and blunt apically, exceeding the digiti only slightly *angularis volcanicus* Evans
7. SGP with some longer, partially erect setae in a group on each side near the sinuation of the margin; parameres with the setae toward the base laterally erect and bristling *anomalus durangoanus* Evans
SGP without a group of setae on each side which are notably longer and more erect than other setae on the plate; setae toward the base of the parameres more or less appressed 8
8. SGP rather distinctly elevated medially, the outer part of the disc as well as the margin with rather coarse setae, those on the disc partially erect; parameres with rather long setae apically *otomi* Evans
SGP less distinctly elevated medially and with only small setae on the disc and apical margin; parameres more weakly setose apically *parvulus* (Banks)

Angularis Species-group

The three species of this group occurring in the United States were treated by me in 1951, but the characters which I presented for separating the females have since proved less than completely reliable. The situation in Mexico is complicated by the fact that two of these species have a subspecies occurring in the highlands of central Mexico, characterized chiefly by slight genitalic differences, while the typical forms of at least two (and probably all three) of these species enter extreme northern Mexico. In addition, still another species occurs at high altitudes in central Mexico. Within this complex, only the male terminalia provide truly reliable characters for identification. Females taken without males can sometimes be placed tentatively by locality and altitude or by use of the provisional characters indicated in the above key. I have omitted from consideration the females of *ano-*

malus anomalus (Dreisbach), not yet recorded from Mexico, and of *anomalus durangoanus* Evans. The males of the latter form have been taken in only two localities, and the females which I formerly associated with them I now feel may belong with *angularis volcanicus*; at least they cannot be separated from that form by any known characters.

Pompilus (*Ammosphex*) *angularis angularis* (Banks)

Psammochares angularis Banks, 1910, Jour. N. Y. Ent. Soc., 18: 115 [Type: ♂, CALIFORNIA: Claremont (C. F. Baker) (MCZ, no. 13, 676)]

Pompilus (*Ammosphex*) *angularis* Evans, 1951, Trans. Amer. Ent. Soc., 77: 232-234.

Pompilus (*Ammosphex*) *angularis angularis* Evans, 1953, Ann. Ent. Soc. Amer., 46: 538.

Rather than provide a description for this form, which occurs only in extreme northern Mexico and which I described fully in 1951, I shall merely indicate its differences from the widely distributed Mexican *angularis volcanicus*, considered below. The males of typical *angularis* have the parameres much longer than the digiti and distinctly attenuate apically (as figured by me in 1951, Fig. 181), while in *a. volcanicus* the parameres are decidedly blunt and only slightly longer than the digiti; thus these two forms can be separated only by extending the genitalia at least enough to study the tips of the parameres. Females of the nominate subspecies show considerable variation in the width of the front (MID .55-.61 X TFD) and also often have more silvery pubescence on the body than in *volcanicus*; they also rather commonly have the comb-spines somewhat longer than the width of the tarsus, while in females which I have taken in close association with male *angularis volcanicus* they are consistently no longer than the width of the tarsus. However, the two forms are not clearly separable in this sex. I would expect to find males in the mountains of Chihuahua and Sonora with parameres of intermediate length between those typical of the two subspecies.

Distribution. — Transcontinental in North America, north to Massachusetts and to Yukon, south to Baja California and Texas, but apparently absent from the southeastern United States.

Mexican specimens examined. — 1 ♀. BAJA CALIFORNIA: 1 ♀,

Sierra San Pedro Martir, 6500 feet, 1 June 1958 (J. Powell) [CIS]. (Map 68.)

***Pompilus (Ammosphex) angularis volcanicus* Evans**

Pompilus (Ammosphex) angularis volcanicus Evans, 1953, Ann. Ent. Soc. Amer., 46: 540-541 [Type: ♂, MEXICO: MEXICO: Nevado de Toluca, about 11,300 feet, 11 July 1951 (PDH) (CAS)].

Female. — Length 4.5-7.5 mm. Black; pubescence mostly dark, obscurely reflecting bluish, nearly always silvery on the sides of the lower front, sometimes also on the temples, clypeus, and parts of the thorax; wings lightly to moderately infuscated, somewhat violaceous, darker along the outer margin. Clypeus 2.8-3.1 X as wide as high, its apical margin rather strongly concave medially. Front rather narrow, MID .55-.58 X TFD; UID .80-.90 X LID; POL and OOL about equal. Third antennal segment usually very slightly shorter than first two together, measuring from .67-.78 X UID. Slope of propodeum low, obliquely declivous on posterior third; propodeum without erect hairs. Spines of tarsal comb not longer than width of tarsus, or barely so, the apical spine on the basitarsus 0.4-0.5 X the length of the second tarsal segment. Marginal cell of fore wing 2.5-3.0 X its own length from the wing tip; SMC2 and 3 both small, strongly narrowed above.

Male. — Length 4.5-6.5 mm. Black; head, thorax and base of abdomen extensively silvery-sericeous; wings hyaline to lightly infuscated, broadly darker along outer margin. MID .56-.60 X TFD; UID and LID subequal; POL and OOL subequal. Third antennal segment 2.0-2.3 X as long as thick, slightly shorter than fourth segment. Marginal cell of fore wing at least 2.5 X its own length from wing tip; third discoidal cell at least twice its own length from wing margin. SGP with its margins tapering evenly to a narrowly rounded apex, covered with minute setulae but without coarse, partially erect setulae (much as in *a. angularis*, as figured by Evans, 1951, fig. 208). Genitalia with the parameres rather broad and blunt apically, long-setose, slightly exceeding the digiti; aedoeagus rather slender and somewhat pointed apically (parameres and volsellae figured by Evans, 1953, fig. 8).

Distribution. — Sierra Madre Occidentale and mountains of central and southern Mexico, from 5500 to over 11,000 feet, but most prevalent between 7000 and 8000 feet. This form is sometimes common in clearings in forests, especially beneath oak trees. (Map 68.)

Mexican specimens examined. — 31 ♀♀, 60 ♂♂. DURANGO: 7 ♀♀, 3 ♂♂, El Salto, about 8000 feet, 3 Aug. 1951 (PDH, HEE) [CAS, CIS, MCZ]. SINALOA: 1 ♂, 6 mi. NE Potrerillos, 19 Mch. 1962 (LS) [UCD]. MICHOACAN: 2 ♀♀, 5 km. W Zacapu, 13 July 1951 (HEE, PDH) [MCZ, CIS]; 1 ♀, Tuxpan, 6000 feet, 7 July



1959 (HEE) [MCZ]. MEXICO: 1 ♀, 1 ♂, Valle de Bravo, 6500 feet, 3 Aug. 1962 (HEE) [MCZ]; 1 ♀, 1 ♂, Nevado de Toluca, about 11,300 feet, 11 July 1951 (PDH) [CAS]; 3 ♀♀, 1 ♂, Teotihuacan Pyramids, 7500 feet, 3 July 1959 (HEE) [CU, MCZ]; 1 ♂, W Slope Popocatepetl, 10,000 feet, 19 May 1959 (HEE) [CU]. MORELOS: 9 ♀♀, 36 ♂♂, 3-4 mi. NW Cuernavaca, 6500-7500 feet, Apr.-June 1959 (HEE) [CU, MCZ, USNM, CIS]; 2 ♀♀, 3 ♂♂, 4 mi. E Cuernavaca, 6000 feet, 25 June 1959 (HEE) [CU]; 2 ♂♂, Cuernavaca, 5500 feet, 5 March 1959 (HEE) [CU]. CHIAPAS: 1 ♂, Nachic, 8000 feet, 27 April 1959 (HEE) [MCZ]; 5 ♀♀, 10 ♂♂, San Cristobal las Cases, 7500 feet, 25-30 April 1959 (HEE) [MCZ, CU].

***Pompilus (Ammosphex) anomalus durangoanus* Evans**

Pompilus (Ammosphex) anomalus durangoanus Evans, 1953, Ann. Ent. Soc. Amer., 46: 541 [Type: ♂, MEXICO: DURANGO: El Salto, about 8000 feet, 3 Aug. 1951 (HEE) (USNM no. 61, 738)].

This is a decidedly weak subspecies, separable from *a. anomalus* (which doubtless will be found to occur in extreme northwestern Mexico) only by having the parameres of the male genitalia more

slender and weakly setose. Typical *anomalus* was described by Dreisbach, 1950, Amer. Midl. Nat., 42: 725-726 (terminalia figured, Figs. 1 and 2) and redescribed by me 1951 (terminalia figured, Figs. 180 and 210). *Anopompilinus arnaudi* Dreisbach (1952, Amer. Midl. Nat., 48: 153-154) is a synonym.

Female. — Unknown; or more probably indistinguishable from other members of this complex.

Male. — Length 4.5-5.5 mm. Black; head, thorax, and base of abdomen extensively silvery; wings nearly hyaline, broadly darker along outer margin. MID .58-.61 X TFD; UID subequal to or slightly exceeding LID; POL and OOL subequal. Third antennal segment somewhat more than twice as long as thick, slightly shorter than fourth segment. Marginal cell of fore wing 2.7-3.0 X its own length from wing tip; third discoidal cell about 1.5 X as wide as high. SGP of rather variable shape, but the sides not approaching evenly as in the preceding species, always somewhat sinuate and often abruptly so, the apical part of the plate then very slender; plate always with an area of rough, partially erect setulae near the sinuation of the sides (as in *a. anomalus*, as figured in Evans, 1951, fig. 210, but allowance must be made for variation in the shape of the plate). Genitalia with the parameres slender, without long, bushy setae apically, clothed with rather short setae which, toward the base, are somewhat bristling (but shorter than in *a. anomalus*); digiti clothed with minute setulae; aedoeagus somewhat less acute apically than in *angularis*, more so than in *parvulus* and *otomi* (see Evans, 1953, fig. 5).



Distribution. — High altitudes, Durango to Puebla. (Map 69.)

Specimens examined. — 7 ♂♂. DURANGO: 5 ♂♂, El Salto, about 8000 feet, 3 Aug. 1951 (HEE, PDH) [USNM, CIS, MCZ]. DISTRITO FEDERAL: 1 ♂, Topilejo, 16 May 1959, about 9000 feet (HEE) [MCZ]. PUEBLA: 1 ♂, Zacatepec, 1 Apr. 1962 (LS) [UCD].

Pompilus (Ammosphex) parvulus (Banks)

Pompiloides parvulus Banks, 1912, Jour. N. Y. Ent. Soc., 19: 227-228 [Type: ♀, COLORADO: Boulder, 22 Aug. 1908 (S. A. Rohwer) (USNM, no. 20, 119)].

Pompilus (Ammosphex) parvulus Evans, 1951, Trans. Amer. Ent. Soc., 77: 234-237.

Pompilus (Ammosphex) parvulus tepahuanus Evans, 1953, Ann. Ent. Soc. Amer., 46: 542 [Type: ♂, MEXICO: DURANGO: El Salto, about 8000 feet, 3 Aug. 1951 (PDH) (CAS)]. New synonym.

This is a rather variable species, and a more careful study has convinced me that there is no basis for regarding the Durango and Zacatecas population as subspecifically distinct from that of the western United States.

Female. — Length 5-10.5 mm. Black; pubescence mostly or wholly dark, in some specimens cinereous or silvery on the lower front; wings lightly to moderately infuscated, darker along the outer margin, somewhat violaceous. Clypeus 2.7-3.0 X as wide as high, its apical margin truncate or weakly concave. Front narrow, MID .53-.56 X TFD; UID .80-.85 X LID; POL equal to or slightly greater than OOL. Third antennal segment about equal to or slightly longer than the first two together, measuring from .71 to .92 X UID. Slope of propodeum low, obliquely declivous on posterior third, surface without erect hairs. Spines of the tarsal comb about as long as the width of the tarsus, or very slightly longer, the apical spine on the basitarsus about half the length of the second segment. Marginal cell of fore wing removed from wing tip by 2.5-3.0 X its own length.

Male. — Length 4.5-8 mm. Black; head, thorax, and base of abdomen extensively silvery-sericeous; wings subhyaline, with a fuscous marginal band. MID .56-.63 X TFD; UID subequal to LID or very slightly less; POL usually slightly exceeding OOL. Third antennal segment slightly over twice as long as thick, subequal to or slightly shorter than fourth segment. SGP with only small setae, as in *angularis*, but the plate wider and less evenly tapering apically than in that species, often somewhat truncate apically. Genitalia with the parameres moderately wide near the middle, tapering toward the apex, the ventral surface clothed with small setae which are not at all bristling and which are barely longer apically than elsewhere; digiti rather broad apically and very weakly

setose; aedoeagus somewhat more rounded apically than in the preceding two species (see Evans, 1951, fig. 179, also 1953, fig. 3).

Distribution. — Western North America, chiefly in mountains and foothills, Zacatecas and Baja California to Alberta and Oregon. (Map 70.)

Mexican specimens examined. — 10 ♀♀, 4 ♂♂. BAJA CALIFORNIA: 1 ♀, Descanso, 1 Sept. 1955 (RMB) [UCD]. DURANGO: 5 ♀♀, 4 ♂♂, El Salto, about 8000 feet, 3 Aug. 1951 (PDH, HEE) [CAS, CIS, MCZ]. ZACATECAS: 4 ♀♀, 15 km. E Sombrerete, about 7000 feet, 28-31 July 1951 (HEE, PDH) [MCZ, CIS].

Pompilus (Ammosphex) otomi Evans, new status

Pompilus (Ammosphex) parvulus otomi Evans, 1953, Ann. Ent. Soc. Amer., 46: 542-543 [Type: ♂, MEXICO: HIDALGO: Zimapán, 11-14 June 1951 (HEE) (USNM, no. 61, 739)].

This species is closely related to *parvulus* and bears somewhat the same relation to that species as does *volcanicus* to *angularis* and *durangoanus* to *anomalus*. However, in this case the degree of structural divergence is somewhat greater, and I shall tentatively regard *otomi* as a full species.

Female. — Length 4-7 mm. Black; pubescence dark, somewhat violaceous, occasionally cinereous or somewhat silvery on the sides of the lower front; wings moderately infuscated, with a darker marginal band, distinctly violaceous. Clypeus about or somewhat more than 3 X as wide as high, truncate or slightly concave below. MID .55 to .61 X TFD; UID .80-.85 X LID; POL and OOL subequal. Third antennal segment usually distinctly shorter than the first two together, equal to only from .60 to .75 X UID. Slope of propodeum low, median line weakly impressed, surface without erect hairs. Spines of the tarsal comb in most specimens measuring slightly longer than the width of the tarsus at their base (1.0-1.4 X), the apical basitarsal spine 0.5-0.8 X the length of the second segment. Marginal cell of fore wing removed from wing tip by 2.5-3.0 X its own length.

Male. — Length 3.5-7.0 mm. Black; body extensively silvery-sericeous; wings subhyaline, the apical margin with a broad fuscous band. MID .56-.62 X TFD; UID subequal to or slightly greater than LID; POL and OOL about equal. Third antennal segment 2.2-2.5 X as long as thick, subequal to or slightly shorter than fourth segment. SGP tapering to a broadly rounded apex, its median line rather strongly raised above the disc; margin armed with stout setae on the apical half, and apical part of disc wholly covered with rather strong, partially erect setae (see fig. 7 in Evans, 1953). Genitalia in general



very similar to those of *parvulus*, but the parameres with much longer setae apically, although these setae are less dense and slightly shorter than in *angularis volcanicus* (see fig. 6 in Evans, 1953).

Distribution. — This species occupies a rather restricted range in the volcanic belt of central Mexico, from Michoacan to Puebla. It has been taken at altitudes from about 7000 to about 10,000 feet. I have taken it at the same time and place as *angularis volcanicus* on some occasions, but my impression is that *otomi* is most prevalent above 9000 feet, *volcanicus* most likely to be encountered below that height. (Map 70.)

Specimens examined. — 28 ♀♀, 52 ♂♂. MICHOCAN: 1 ♀, Huajumbaro, 7600 feet, 5 Aug. 1962 (HEE) [MCZ]. MEXICO: 2 ♀♀, 12 ♂♂, Agua Bendita & vic., 9000-10,000 feet, 4 Aug. 1962 (HEE) [MCZ]; 2 ♀♀, 5 ♂♂, W Slope Popocatepetl, about 10,000 feet, Mch., May, July (HEE) [MCZ, CU]. DISTRITO FEDERAL: 1 ♀, 3 ♂♂, Topilejo & vic., 9000-10,000 feet, May, July (HEE) [MCZ, CU]; 3 ♀♀, Puerto de las Cruces, about 10,000 feet, May, Aug. (HEE, CY) [MCZ]. HIDALGO: 8 ♀♀, 11 ♂♂, Zimapán, 11-14 June 1951 (HEE) [USNM, CU, MCZ]. PUEBLA: 4 ♀♀, 11 ♂♂, 14 mi. W Huauchinango, 17 June 1951 (PDH, HEE) [CIS,

CU, MCZ]. MORELOS: 7 ♀ ♀, 10 ♂ ♂, 9 mi. N Cuernavaca, May-July, 7500-8500 feet (HEE, PDH) [MCZ, CU, CIS].

Solonus Species-group

This small complex of three species occupies a position intermediate between the *angularis* and *luctuosus* groups. The species tend to be bluer and are often larger than in the *angularis* group, and there may be a small amount of erect hair on the propodeum. The terminalia are more like those of the *luctuosus* group, but the pencil of setae on the subgenital plate is short and inconspicuous. The most widely distributed species of this group, *solonus*, has a distinctive subspecies in the highlands of central Mexico, and in this area there occurs a second species, *zapotecus* Cameron, probably a derivative of *solonus*. The third species of this complex, *silvivagus* Evans, ranges from Texas and Colorado to California and has not yet been taken in Mexico, although it doubtless occurs in the northern part. I formerly considered *silvivagus* a subspecies of *solonus*, but it is now apparent that the ranges of the two forms overlap widely.

Pompilus (*Ammosphex*) *solonus solonus* (Banks)

Pompiloides solonus Banks, 1914, Jour. N. Y. Ent. Soc., 22: 303 [Type: ♀, ARIZONA: Garces, August (Biederman) (MCZ, no. 13, 672)].

Pompilus (*Ammosphex*) *solonus* Evans, 1951, Trans. Amer. Ent. Soc., 77: 239-241.

Pompilus (*Ammosphex*) *solonus solonus* Evans, 1953, Ann. Ent. Soc. Amer., 46: 538.

Since this form occurs only in extreme northern Mexico and differs only slightly from *solonus teotihuacanus*, described below, and since I described it fully in 1951, I shall not present a description here. The males exhibit minor but constant differences in the terminalia from *s. teotihuacanus*, as indicated in the key. The females of the two forms cannot be clearly separated; the *solonus solonus* females which I have seen average smaller in size and in general are somewhat more intensely bluish than in *s. teotihuacanus*.

Distribution. — Arizona, Utah, California, and northern Baja California. See Evans, 1951, for U. S. records. (Map 69.)

Mexican specimens examined. — 2 ♀ ♀, BAJA CALIFORNIA: 1 ♀, Sierra San Pedro Martir, 5 mi. NE Encantada, 9000 feet, 31 May

1958 (JP) [CIS]; 1 ♀, Sierra San Pedro Martir, 3 mi. S Encinas, 3 June 1958 (JP) [CIS].

Pompilus (Ammosphex) solonus teotihuacanus Evans

Pompilus (Ammosphex) solonus teotihuacanus Evans, 1953, Ann. Ent. Soc. Amer., 46: 538-540 [Type: ♂, MEXICO: MEXICO: Teotihuacan Pyramids, 6 July 1951 (HEE) (USNM, no. 61, 737)].

Female. — Length 9.5-12 mm. Integument black with a weak bluish luster; pubescence wholly dark, with fairly strong bluish or blue-green reflections; fore wing moderately infuscated, darker along outer margin, violaceous; hind wings subhyaline, darker apically. Scape hairy beneath; head rather strongly setose; thoracic dorsum and sides of the propodeal declivity sparsely setose. Clypeus about 3 X as wide as high, truncate or weakly concave below. Front narrow, MID .53-.55 X TFD; eyes subparallel below, but rather strongly convergent above, UID .75-.85 X LID; POL:OOL about as 5:4. Third antennal segment much longer than first two together, equal to from .88 to .95 X UID. Comb-spines of front tarsus from 2-3 X as long as width of tarsus at their base, apical basitarsal spine 0.7-1.0 X as long as second tarsal segment. Marginal cell of fore wing from 1.7-2.0 X its own length from the wing tip.

Male. — Length 5-10 mm. Black, integument often with a faint bluish luster; pubescence bluish or blue-green except silvery or cinereous over much of the head, leg-bases, and ventral parts of the thorax, sometimes silvery over most of the thorax and base of the abdomen; wings lightly to moderately infuscated, with a darker marginal band. Scape hairy below; head and prothorax rather strongly setose; propodeum with or without weak setae on the sides. Front rather narrow, UID subequal to or slightly exceeding LID; ocelli about as in female. Third antennal segment somewhat more than twice as long as thick, about equal to fourth segment. SGP with the sides tapering to a narrowly rounded apex; median area strongly elevated, covered with short, erect, bristling setae; posteriorly, at the end of the median elevation and just before the tip of the plate, there is a group of somewhat longer setae. Genitalia with the parameres extremely slender, linear, much exceeding the digiti and bearing some rather long setae apically; digiti wholly covered with short setae ventrally; aedoeagus rounded apically, the apical margin spinose (see fig. 2 in Evans, 1953).

Distribution. — Moderately high altitudes (6200-7500 feet), southern Chihuahua to Morelos and the state of Mexico. The Chihuahua records are based on females only, and although these females are very similar to the allotype of *teotihuacanus*, no clear-cut characters are known for separating this form from typical *solonus*. Presumably there is a zone of intergradation in Chihuahua, for southern

Arizona males all belong clearly to *s. solonus*. (Map 69.)

Specimens examined. — 8 ♀♀, 8 ♂♂. CHIHUAHUA: 2 ♀♀, Santa Barbara, 6200 feet, 23 April, 13 May 1947 (G. M. Bradt) [AMNH]. DURANGO: 1 ♂, La Resolana, 21 Feb. 1953 (EIS) [CIS]. ZACATECAS: 2 ♂♂, 15 km. E Sombrerete, about 7000 feet, 28-31 July 1951 (PDH, HEE) [CIS, MCZ]. HIDALGO: 3 ♀♀, Pachuca & vic., 7300-7900 feet, June-July [KU]; 1 ♀, Tulancingo, 6750 feet, 14 June 1961 [KU]. MEXICO: 2 ♀♀, 3 ♂♂, Teotihuacan Pyramids, about 7500 feet, June-July 1951 (HEE, PDH) [USNM, MCZ, CIS]. MORELOS: 2 ♂♂, 4 mi. NW Cuernavaca, about 7500 feet, 26-28 June 1959 (HEE) [MCZ, CU].

***Pompilus (Ammosphex) zapotecus* Cameron**

Pompilus zapotecus Cameron, 1893, Biol. Centr.-Amer., Hymen. II, p. 193, pl. 11, fig. 11 [Type: ♀, MEXICO: GUERRERO: Xucumanatlán, 7000 feet (HHS) (BMNH, no. 19, 694)]. — Dalla Torre, Cat. Hymen., VIII, p. 336.

This species has not been recognized since its description. Cameron's statement that the sides of the propodeum project as "blunt teeth" is erroneous; in the type (which otherwise agrees perfectly with his description and figure) the propodeum merely has the usual oblique declivity, the sides of which are not notably protuberant. Although the tarsal comb is absent in this species, it is otherwise strikingly like *solonus* and is probably a specialized derivative of that species.

Description of type female. — Length 7.5 mm.; fore wing 6 mm. Body dark steel blue, overlaid by a fine pubescence which reflects various shades of blue and blue-green, except the pubescence brownish on the scape, clypeus, mesosternum, and the coxae beneath, also with silvery reflections on the lower front and temples; fore wings rather strongly infuscated, with a broadly darker apical margin, strongly violaceous; hind wings lightly infuscated, darker apically. Head and prothorax with a few weak setae, the propodeum without setae. Head 1.18 X as wide as high; labrum partially exserted; clypeus 3 X as wide as high, its apical margin rather strongly concave. Front narrow, MID .54 X TFD; MID 1.15 X LID; UID .85 X LID. Temples very narrow; vertex passing straight across between tops of eyes. Ocelli in a right triangle; POL:OOL = 10:9. First four antennal segments in a ratio of about 17:8:25:20, segment three equal to .86 X UID. Pronotum broadly angulate behind; postnotum medially slightly more than half the length of the metanotum; pro-

podeum sloping weakly in front, with an oblique, slightly concave declivity on the posterior third. Front basitarsus with two short, stout spines close together near the middle, also two more at the apex, but without a distinct series of comb-spines, the second segment also without a spine at the middle and only some short apical spines. Apical tarsal segments spined beneath, but the spines mostly confined to the basal half of the segment. Longer spur of hind tibia .66 X the length of the basitarsus. Fore wing with the marginal cell twice its own length from the wing tip; SMC2 and 3 about equal in size, both narrowed by slightly more than half above.

Male. — Length 4.3-6.3 mm. Integument black, with obscure dark steel-blue reflections; pubescence silvery over much of the head, thorax, legs, abdominal venter and basal parts of basal tergites, on the vertex and parts of the thoracic dorsum and abdomen dark, brownish-violaceous; wings lightly infuscated, darker along outer margin. Head and prothorax with a few thin setae, the body otherwise without setae. Head about 1.2 X as wide as high. Clypeus about 2.3 X as wide as high, its lower margin evenly concave, the labrum strongly exerted beyond the concavity. Front narrow, MID .56-.60 X TFD; UID subequal to or slightly exceeding LID; ocellar triangle rather compact, POL equal to or slightly less than OOL. First four antennal segments in a ratio of about 12:6:13:13, segment three 3 X as long as thick. Pronotum strongly angulate behind; postnotum as long as metanotum; propodeum weakly impressed medially. Last segment of front tarsus strongly lobed on the inner margin as usual in this subgenus. Legs relatively weakly spinose; longer spur of hind tibia .7 the length of the basitarsus. Fore wing with the marginal cell 2.0-2.2 X its own length from the wing tip; SMC2 and 3 both small and strongly narrowed above. S6 with a strong U-shaped emargination. SGP rather broad, broadly rounded apically, the median line roundly elevated; surface of plate setose, especially the median elevation, but the setae directed backward, with a group of somewhat longer setae just before the apex. Genitalia with the parameres rather wide, with a large hyaline portion along the inner margin, bearing strong setae; digiti rather broad, their upper, outer margin hyaline and with reduced setae; parapenial lobes very short; aedoeagus rounded apically, bearing some unusually large marginal spines (fig. 55).

Distribution. — Known only from Durango, Guerrero, and Morelos, at altitudes of from 6000 to 7500 feet. (Map 71.)

Specimens examined. — 6 ♀♀, 5 ♂♂. MEXICO: GUERRERO: 1 ♀, Xucumanatlán, 7000 feet [type, BMNH]. MORELOS: 3 ♀♀, 5 ♂♂, 4 mi. E Cuernavaca, 6000 feet, 16-29 June 1959 (HEE) [MCZ, CU]; 1 ♀, 4 mi. NW Cuernavaca, 7500 feet, 28 June 1959 (HEE) [MCZ]. DURANGO: 1 ♀, 4 mi. N Nombre de Dios, 13 May 1962 (LS) [UCD].

Variation. — The available females vary in length from 6 to 8 mm.; MID varies from .53 to .54 X TFD, antennal segment three



from .82 to .95 X UID. Otherwise they agree very closely with the type. In two specimens a very short spine is visible on the inner side of the second segment of the front tarsus, apparently a vestigial comb-spine.

Luctuosus Species-group

Although this group includes several species in northern North America and in Eurasia, only one species is known to enter Mexico. Members of this group have the marginal cell and other cells of the fore wing less far removed from the outer wing margin than in the preceding two groups, and the propodeum is generally hairier; also, there is a pencil of rather long setae on the male subgenital plate. I shall take occasion to describe a new species of this group from California following the description of the one species occurring in Mexico.

Pompilus (Ammosphex) occidentalis (Dreisbach)

Anopompilinus occidentalis Dreisbach, 1950, Amer. Midl. Nat., 42: 726-728
 [Type: ♂, CALIFORNIA: Pinecrest, Tuolumne Co., 29 July 1947 (P. H. Arnaud) (MCZ, no. 28, 149)].

Pompilus (Ammosphex) occidentalis Evans, 1951, Trans. Amer. Ent. Soc., 77: 253-255. — Evans, 1953, Ann. Ent. Soc. Amer., 46: 538.

Female. — Length 6-10 mm. Black, the integument faintly to rather strongly reflecting deep steel-blue, especially noticeable on the front; pubescence wholly dark, with bluish reflections; wings moderately infuscated, darker along the outer margin, violaceous. Head, thorax, and propodeum with rather abundant strong, dark setae. Clypeus about 3 X as wide as high, the apical margin shallowly concave. Front of moderate breadth, MID .54-.60 X TFD; UID .80-.90 X LID; POL and OOL subequal. Third antennal segment slightly longer than the first two together, equal to from .72-.82 X UID. Front basitarsus with three comb-spines, the spines 1.0-2.0 X as long as the width of the tarsus, the apical one .5-.7 X the length of the second tarsal segment. Marginal cell removed from the wing tip by from 1.5-1.9 X its own length.

Male. — Length 5-9 mm. Coloration as in female except wings less heavily infuscated and pubescence conspicuously silvery on the clypeus and lower front, often also on the propodeum and parts of the coxae and pleura. Head, thorax, and propodeum with rather numerous strong, dark setae. Front of moderate breadth; UID subequal to or slightly greater than LID; POL and OOL subequal. Third antennal segment about 2.5 X as long as thick, equal to or very slightly shorter than fourth segment. SGP nearly flat, the apex rounded, the disc with a subapical pencil of very long setae (Evans, 1951, fig. 216). Genitalia characterized by unusually large parameres which near some strong setae apically but otherwise bear small, rather sparse, setae; digiti slender, covered with small setae; parapenial lobes unusually small; aedoeagus moderately broad, the margin for the entire apical half beset with short spines (Evans, 1951, fig. 187).

Distribution. — Alberta and British Colombia south to the central Mexican volcanic belt. Presumably the species occurs throughout the higher parts of the Sierra Madre Occidentale, but at present it has been collected only from Michoacan to Puebla, at altitudes of from 7000 to 12,000 feet. This species is characteristic of clearings in forested areas, often in company with its congener *otomi*. (Map 71.)

Mexican specimens examined. — 11 ♀♀, 13 ♂♂. MICHOCAN: 1 ♀, Cerro Tancitaro, 12,000 feet, 9 July 1940 (Hoogstraal & Knight) [MCZ]. MEXICO: 2 ♂♂, Agua Bendita, 9000 feet, 4 Aug. 1962 (HEE) [MCZ]; 8 ♀♀, 11 ♂♂, W slope Popocatepetl, about 10,000 feet, March, May-July, 1951, 1959 (HEE, PDH) [MCZ, CU, CIS]. MORELOS: 1 ♀, 9 mi. N Cuernavaca, 8500 feet, 27 June 1959 (HEE) [MCZ]. PUEBLA: 1 ♀, 14 mi. W Huauchinango, about 7000 feet, 16 June 1951 (HEE) [MCZ].

Variation. — The Mexican specimens examined tend toward smaller size and more intensely bluish coloration than U. S. speci-

mens; also, the comb-spines of the female are often but slightly if at all longer than the width of the tarsus. However, in the absence of any differences in the male terminalia or of any other clear-cut structural differences, it does not seem worthwhile granting subspecific status to the population in central Mexico.

Pompilus (Ammosphex) wasbaueri new species

Holotype. — ♂, CALIFORNIA: Orinda Cross Rd., Contra Costa Co., 25 Aug. 1953 (M. Wasbauer) [CAS].

Description of type male. — Length 5.5 mm.; fore wing 4.6 mm. Black, except tips of mandibles ferruginous; greater part of head, thorax, coxae, and propodeum silvery-sericeous; remainder of legs, vertex, parts of thoracic dorsum, and abdomen with light brownish pubescence; wings lightly infuscated, slightly darker along the outer margin. Temples and propleura with some pale hairs, the front with a few dark hairs, but the body otherwise completely without erect hairs except for a group on the SGP, described below. Labrum partially exerted beyond the slightly concave margin of the clypeus, the clypeus 2.5 X as wide as high. Front moderately wide, MID .60 X TFD; UID very slightly exceeding LID; POL and OOL equal. First four antennal segments in a ratio of about 13:6:12:12, segment three 2.5 X as long as thick. Pronotum obtusely angulate behind; median portion of postnotum nearly as long as metanotum; slope of propodeum very weak except roundly declivous on posterior fourth. Apical segment of front tarsus and claws as usual in the subgenus; longer spur of hind tibia .73 X the length of the basitarsus. Fore wing with the marginal cell twice its own length from the wing tip; SMC2 and 3 subequal in size, both higher than wide. S6 with a broad, U-shaped emargination. SGP tapering to a subacute apex, its sides toward the base simple, not armed with stout setae; median portion of plate strongly elevated, then obliquely declivous to the apex, the crest of the declivity bearing a group of 10-12 rather long setae in a linear series (not a compact pencil), the plate without other long setae (fig. 85). Genitalia with the parameres only slightly longer than the aedoeagus, but very broad, in considerable part hyaline and very weakly setose, but with several strong apical setae; disc of digitus rather broad, covered with small setae; parapenial lobes nearly as long as digiti; aedoeagus moderately wide, its margin armed with spines on the apical third (fig. 56).

Paratype. — 1 ♂, CALIFORNIA: Strawberry, Tuolumne Co., 6 Aug. 1960 (E. Jessen) [CIS].

Variation. — The paratype is the same size as the type and is very similar in every respect, the standard measurements being exactly the same.

Remarks. — This species will run readily to *imbecillus* Banks in my 1951 key to male *Ammosphex*. It differs from *imbecillus* in having the setae on the subgenital plate in a linear series rather than in a more or less compact tuft, also in having much broader, shorter, and less strongly setose parameres. The resemblance to *luctuosus* is also close, but that species lacks the strong median elevation of the subgenital plate and also has quite different parameres.

Subgenus ARACHNOSPILA Kincaid

Arachnospila Kincaid, 1900, Proc. Wash. Acad. Sci., 2: 509 [Type species: *Arachnospila septentrionalis* Kincaid (= *fumipennis fumipennis* Zetterstedt), monobasic]. — Evans, 1951, Trans. Amer. Ent. Soc., 77: 255-269 (U. S. spp.).

Pycnopompilus Ashmead, 1902, Canad. Ent., 34: 83 [Type species: *Pompilus scelestus* Cresson, original designation]. — Banks, 1947, Bull. Mus. Comp. Zool., 99: 422-423 (So. American spp.).

Subgeneric characters. — Length 6.5-20 mm.; black, the abdomen sometimes rufous (but not in the species considered here). Body strongly hairy, especially the head, prothorax, and propodeum. Malar space wanting, labrum but slightly if at all exerted; antennae long and slender. Pronotum sharply angulate behind. Front tarsus of female with a strong comb. Last segment of front tarsus of male produced on the inner margin, but less strongly than in *Ammosphex*, this segment widest about two-thirds the distance to the apex. Pulvillar comb well developed; apical tarsal segments with median spines beneath at least in the females. Fore wing with the marginal cell long, removed from the wing tip by approximately its own length, radial vein nearly evenly arcuate; SMC2 and 3 both fairly wide above (fig. 22). Genitalia with the basal hooklets double, the parameres strong, exceeding the other appendages; aedeagus simple, without spines on the margin.

Distribution. — Holarctic, but also represented by several species in South America. All three of the North American species are known to enter Mexico, but none are known to occur in Central America.

Key to Species

Females

1. Scape not hairy; apical margin of clypeus rather strongly arcuately excised
..... *arctus* Cresson

- Scape with a number of hairs which are usually about as long as the thickness of the scape; clypeus truncate or weakly concave apically 2
2. Ocelli forming a right or obtuse angle in front, OOL much exceeding POL; upper front without strong punctures; front basitarsus with three or (more commonly) four comb-spines *scelestus* Cresson
- Ocelli forming an acute angle in front, OOL subequal to or slightly exceeding POL; setigerous punctures on upper part of front somewhat larger than usual; front basitarsus with three comb-spines
 *fumipennis eureka* (Banks)

Males

1. SGP merely convexly raised medially, toward the base with a pair of elevations (rounded, acute, or sometimes obsolescent); parameres of genitalia slender throughout *arctus* Cresson
- SGP keeled, the median line strongly and sharply elevated; parameres much broadened apically 2
2. Median elevation of SGP sloping evenly from front to rear, its posterior slope convex or nearly straight; digiti strongly spatulate
 *scelectus* Cresson
- Median elevation of SGP abruptly declivous behind, the posterior slope concave; digiti less strongly enlarged apically
 *fumipennis eureka* (Banks)

Pompilus (*Arachnospila*) *arctus* Cresson

Pompilus arctus Cresson, 1865, Proc. Ent. Soc. Phila., 4: 453 [Type: ♂, COLORADO (ANSP, no. 554)]. — Cresson, 1867, Trans. Amer. Ent. Soc., 1: 92.

Psammochares anoplinus Banks, 1919, Bull. Mus. Comp. Zool., 63: 231-232 [Type: ♀, ALBERTA: Medicine L. to Jasper, 4 July 1915 (J. C. Bradley) (CU, no. 683)]. Synonymy by Evans, 1951.

Pycnopompilus siouxensis Dreisbach, 1950, Amer. Midl. Nat., 43: 592, 593, 598 [Type: ♂, NEBRASKA: Glen, Sioux Co., 13 Aug. 1906 (Univ. Nebraska)]. Synonymy by Evans, 1951.

Pycnopompilus sculleni Dreisbach, 1950, *ibid.*, pp. 587, 594, 598 [Type: ♂, OREGON: Cornucopia, 7100 feet, 25 July 1936 (HAS) (MCZ, no. 28, 382)]. Synonymy by Evans, 1951.

Pompilus (*Arachnospila*) *arctus* Evans, 1951, U. S. Dept. Agri. Monogr. 2, p. 935. — Evans, 1951, Trans. Amer. Ent. Soc., 77: 258-261. — Evans, 1956, Ent. News, 67: 10.

Pycnopompilus parvus Dreisbach, 1952, Amer. Midl. Nat., 48: 152-153 [Type: ♂, UTAH: Kelton, 24 Aug. 1949 (G. F. Knowlton) (USNM, no. 66, 587)]. Synonymy by Evans, 1956.



Female. — Length 7.5-14.5 mm. Black; pubescence wholly dark, with obscure to fairly strong bluish reflections; fore wings moderately infuscated, darker apically; hind wings lightly infuscated, also darker apically. Scape without erect hairs; head, thorax, and propodeum otherwise moderately to rather densely hairy. Clypeus about 3 X as wide as high, its apical margin distinctly arcuately excised. MID .59-.63 X TFD; UID .75-.85 X LID; ocelli in approximately a right triangle, POL usually slightly less than OOL. Third antennal segment varying from .60 to 1.0 X UID. Front basitarsus with either three or four comb-spines, the spines varying from 1 to 3 X as long as the width of the basitarsus.

Male. — Length 6.5-12 mm. Black, inner and outer orbits often with small pale streaks; pubescence nearly always silvery on the front, sometimes on parts of the thorax; wings hyaline or lightly infuscated, with a darker outer marginal band. Scape not hairy, but front and vertex rather strongly hairy; propodeum with some strong erect hairs. Front broad, MID .60-.65 X TFD; UID subequal to or slightly greater or less than LID; POL usually less than OOL. SGP convex medially, toward the base with a pair of elevations which may be rounded or acute, sometimes barely evident. Genitalia with the parameres slender throughout; digiti smaller apically and with fewer setae than in the two following species (see fig. 191 in Evans, 1951).

Distribution. — This species ranges from Yukon and Labrador to Central Mexico and to Virginia. (Map 72.)

Mexican specimens examined. — 1 ♀, 1 ♂. HIDALGO: 1 ♂, 4

mi. W Pachuca, 16 June 1961 (KU Mex. Exped.) [KU]. MEXICO: 1 ♀, Teotihuacan Pyramids, 6 July 1951 (HEE) [MCZ].

Pompilus (*Arachnospila*) *scelestus* Cresson

Pompilus scelestus Cresson, 1865, Proc. Ent. Soc. Phila., 4: 451 [Lectotype: ♀, COLORADO (ANSP, no. 415)]. — Cresson, 1867, Trans. Amer. Ent. Soc., 1: 88.

Pompilus montezuma Cameron, 1893, Biol. Centr.-Amer., Hymen. II, p. 193, pl. 11, fig. 10 [♂ only; ♀ (which I consider the type) misassociated (see *Episyron biguttatus montezuma*)].

Pompilus pulchrinellus Cameron, 1893, *ibid.*, p. 194, pl. 11, fig. 12 & 12a [Type: ♀, MEXICO: SONORA: No. part (Morrison) (BMNH, no. 19, 693)]. New synonym.

Pompilus omiltemensis Cameron, 1893, *ibid.*, p. 197, pl. 11, Fig. 18 & 18a [Type: ♂, MEXICO: GUERRERO: Omilteme, 8000 feet, Aug. (HHS) (BMNH, no. 19, 687)]. New synonym.

Psammochares astur Banks, 1912, Jour. N. Y. Ent. Soc., 19: 225 [Type: ♀, MARYLAND: Great Falls, 12 July (NB) (MCZ, no. 13, 688)]. Synonymy by Evans, 1951.

Psammochares sublaevis Banks, 1921, Ann. Ent. Soc. Amer., 14: 20 [Type: ♀, INDIANA: Marion Co. (H. Morrison) (MCZ, no. 13, 693)]. Synonymy by Evans, 1951.

Pycnopompilus subscelestus Dreisbach, 1950, Amer. Midl. Nat., 43: 591-593 [Type: ♂, COLORADO: Ute Creek, 30 July (R. W. Dawson) (Univ. Nebraska)]. Synonymy by Evans, 1951.

Pompilus (*Arachnospila*) *scelestus* Evans, 1951, U. S. Dept. Agri., Monogr. 2, p. 935. — Evans, 1951, Trans. Amer. Ent. Soc., 77: 261-265.

This is a widely distributed and variable species, as the long synonymy suggests. Cameron misassociated the sexes of both *montezuma* and *omiltemensis*. In the latter case, it is obvious that the male should be considered the type, since the figures and also the species name fit the male but not the female; the female, from Panama, belongs to *Anoplius* (*Anoplius*) *simulans* (Cresson), and is listed under that species. The male *omiltemensis* is a small but otherwise typical *scelestus*, actually part of the same series which includes the male *montezuma*. In the case of *montezuma*, however, it is clear that Cameron's figure is that of the female, from Chilpancingo, which is an *Episyron*. Also, Cameron provides only a very short description of the male, while his description of the female is much longer and his alignment of the species, based on the anal vein of the hind wing, fits the female but not the male. Thus the name *montezuma* is here

referred to *Episyron*.

Female. — Length 6.5-20 mm. Black; pubescence wholly dark, rather strongly reflecting bluish; wings fuscous, violaceous, slightly darker along the outer margin. Scape with at least a few setae below; head and thorax with abundant dark setae, including the coxae and often to some extent the femora. Clypeus 2.6-3.0 X as wide as high, its apical margin weakly concave medially. Front broad, MID .59-.63 X TFD; UID .75-.85 X LID. Front angle of ocellar triangle a right angle or somewhat greater, POL:OOL about as 4:5. Third antennal segment equal to from .75 to 1.0 X UID. Front basitarsus with three or (more commonly) four strong comb-spines.

Male. — Length 6-16 mm. Black, except upper outer and middle inner orbits usually with a small pale spot or streak; pubescence fuscous, reflecting bluish, sometimes silvery on the front; wings as in female. MID .60-.63 X TFD; UID about .9 X LID; ocelli about as in female. SGP with a high median keel which in profile is rather evenly, convexly arcuate, or the posterior slope may be nearly straight. Genitalia with the parameres much broadened toward the apex, which is subtruncate; digiti strongly capitate, densely setose (see fig. 190 in Evans, 1951).

Distribution. — Transcontinental in southern Canada, south to Georgia, Oaxaca, and California. Mexican records are from altitudes of from 5000 to 8500 feet. (Map 72.)

Mexican specimens examined. — 10 ♀♀, 15 ♂♂. SONORA: 1 ♀, No. part (Morrison) [BMNH]. CHIHUAHUA: 1 ♀, Arroyo Meseno, Sierra del Nido, 7600 feet, 21 July 1959 (W. C. Russell) [CIS]. MICHOACAN: 1 ♀, 4 mi. E Morelia, 6500 feet, 9 July 1959 (HEE) [CU]; 1 ♂, 11 mi. E Tuxpan, 13 Aug. 1957 (Chemsak & Rannells) [CIS]. MEXICO: 1 ♀, 1 ♂, 34 km. W Toluca, 8500 feet, 9 Aug. 1962 (HEE) [MCZ]; 1 ♀, Teotihuacan Pyramids, 6 July 1951 (HEE) [MCZ]. HIDALGO: 1 ♀, 5 mi. N Tizayuca, 13 Sept. 1946 (Ross & Skinner) [CAS]. VERACRUZ: 2 ♂♂, 5 mi. E Acultzingo, 5000 feet, 9 June 1959 (HEE) [CU, MCZ]. MORELOS: 3 ♂♂, 4 mi. NW Cuernavaca, 7500 feet, 12 May 1959 (HEE) [CU, MCZ]; 1 ♀, 3 mi. N Cuernavaca, 7500 feet, 14 Mch. 1959 (HEE) [MCZ]; 1 ♂, Cuernavaca, 29 July 1961 (RRD) [MSU]. GUERRERO: 2 ♀♀, 7 ♂♂, Omilteme, 8000 feet, Aug. (HHS) [BMNH]. OAXACA: 1 ♀, Oaxaca [BMNH].

Pompilus (Arachnospila) fumipennis eureka (Banks)

Psammochares eureka Banks, 1919, Bull. Mus. Comp. Zool., 63: 231-232

[Type: ♀, CALIFORNIA: Ingleside, 25 Aug. 1908 (J. C. Bradley) (MCZ, no. 10, 397)].

Psammochares catalinae Banks, 1933, *Psyche*, 40: 7 [Type: ♀, ARIZONA: Mt. Lemmon, Santa Catalina Mts., 29 July 1917 (JB) (MCZ, no. 17, 039)]. Synonymy by Evans, 1951.

Pompilus (Arachnospila) fumipennis eureka Evans, 1951, U. S. Dept. Agri., Monogr. 2, p. 935. — Evans, 1951, *Trans. Amer. Ent. Soc.*, 77: 267-269.

Female. — Length 7.5-14 mm. Black; pubescence wholly dark, with bluish reflections usually weaker than in *scelestus*; wings fuscous, violaceous, slightly darker along the outer margin. Body hairy about as in *scelestus*. Clypeus 2.8-3.0 X as wide as high, its apical margin weakly concave. Front of moderate breadth, MID .57-.60 X TFD; upper part of front with some of the setigerous punctures rather conspicuous. Front angle of ocellar triangle slightly less than a right angle; POL:OOL about as 9:10 or as 1:1. Third antennal segment equal to from .80 to .97 X UID. Front basitarsus always with three comb-spines.

Male. — Length 6-11.5 mm. Color of body, wings, and pubescence as in *scelestus* except the pubescence generally with duller, darker bluish reflections. Eyes converging slightly at the top, UID slightly less than LID; ocelli forming an acute angle in front, POL equal to or less than OOL. SGP strongly keeled on the basal part, the keel abruptly and concavely declivous on the posterior half. Genitalia similar to those of *scelestus*, but the parameres tending to be more rounded apically, the digiti distinctly smaller apically and less densely setose (see fig. 189 in Evans, 1951).

Distribution. — I consider *eureka* to be a subspecies of the Holarctic *fumipennis*, ranging from British Columbia and Montana south to the mountains of northern Mexico. (Map 72.)

Mexican specimens examined. — 3 ♀♀. BAJA CALIFORNIA: Sierra San Pedro Martir: 1 ♀, 9000 feet, 5 mi. NE Encantada, 31 May 1958 (W. D. Patterson) [CIS]; 1 ♀, 6500 feet, La Grulla, 1 June 1958 (JP) [CIS]; 1 ♀, 6000 feet, Las Encinas, 27 May 1958 (JP) [CIS].

Genus APORINELLUS Banks

Aporinellus Banks, 1911, *Proc. Ent. Soc. Wash.*, 13: 238 [Type species: *Aporus fasciatus* Smith, designated by Banks, 1912]. — Banks, 1912, *Jour. N. Y. Ent. Soc.*, 19: 223, 230. — Bequaert, 1919, *Psyche*, 26: 115-123 (Nearctic spp.). — Banks, 1947, *Bull. Mus. Comp. Zool.*, 99: 429 (So. American spp.). — Evans, 1951, *Trans. Amer. Ent. Soc.*, 77: 275-300 (U. S. spp.).

Ferreoloides Haupt, 1929, Mitt. Zool. Mus. Berlin, 15: 150, 153 [Type species: *Pompilus moestus* Klug; designated by Bradley, 1944]. — Bradley, 1944, Eos, 20: 93-100 (list of Old World spp.).

Eupompiloides Gussakovsky, 1935, Konowia, 14: 141 [Type species: *Pompilus moestus* Klug, monobasic].

Ceratopompilus Bradley, 1944, Eos, 20: 95, 97 [Type species: *Pompilus sexmaculatus* Spinola, original designation].

Generic characters. — Small wasps, 4 to 13 mm. in length. Males predominantly black, extensively patterned with pale pubescence, the abdomen prominently banded; females generally of similar color, but sometimes partly or almost wholly rufous or with the pale pubescence much reduced. Head, prothorax, and apex of female abdomen somewhat setose, body otherwise without erect hairs. Labrum slightly if at all exserted; clypeus wider than lower front, truncate below; malar space very short. Pronotum fairly long, sloping gradually in profile, its posterior margin arcuate or nearly straight. Postnotum completely absent dorsally, the metanotum and propodeum in broad contact. Posterior lateral angles of propodeal disc produced into distinct dentiform processes. Legs spinose; female with a strong tarsal comb; apical tarsal segments not or weakly spined beneath; pulvillar comb moderately strong in female; apical segment of front tarsus of male simple. Claws dentate in all Nearctic species (except inner front tarsal claws of male bifid); all claws bifid in both sexes in some exotic forms. American forms often with only two SMCs in the fore wing, but Old World species with three; fore wings tending to fold longitudinally along a line of weakness just above media; basal vein of fore wing arcuate on the upper half; transverse median vein meeting media well before the origin of the basal vein (fig. 23). Male SGP with paired basal lateral appendages, as in most *Hesperopompilus*. Male genitalia with the basal hooklets wanting; parapeanal lobes stout, notched near the base of the aedeagus; digiti somewhat spatulate, its disc with an area of microscopic sculpturing.

Distribution. — Throughout temperate and tropical parts of the world except the Australian region. The genus is widely distributed in South America, but there are only a few South American species and these are not well represented in collections.

Remarks. — I recognized six Nearctic species of this genus in 1951, and in 1957 (Pan-Pacific Ent., 33: 184) added a seventh, *borregoensis*, from San Diego Co., Calif. I have since seen *borregoensis* from San Bernardino Co., Calif. [1 ♀, 7 mi. W Salt Wells, 31 March 1959 (G. I. Stage) (CIS)], from Riverside Co., Calif. [1 ♂, Thousand Palms, 7 Apr. 1955 (W. R. M. Mason) (CNC)], from Cochise Co., Ariz. [1 ♂, Elfrida, 2 May 1956 (F. Werner, swept from alfalfa) (MCZ)], and from two localities in Nevada [2 ♂ ♂,

Nixon, Washoe Co., 22 June 1962 (M. Irwin) (UCD); 3 ♀♀, 1 ♂, 12 mi. NE Stillwater, Churchill Co., 27 June 1961 (FDP) (UCD)]. There is little question that this species will be found to occur in Sonora and perhaps other parts of northern Mexico. I have included it in the following key but not treated it in the text. The other six Nearctic species all occur widely in Mexico, and at least four of them enter Central America. Unfortunately four of these six species must be called by different names than I used in 1951. I feel, however, that study of the Mexican fauna has placed our knowledge of these species on a considerably higher level than before.

Key to Species

Females

1. Ultimate tarsal segments with from one to three minute spines beneath, not counting those at the apex; SMC2 of fore wing small, less than twice as wide as high *taeniatus taeniatus* (Kohl)
 Ultimate tarsal segments without a trace of spines beneath, except apically; SMC2 (or SMC2 plus 3 when both are present) at least twice as wide as high 2
2. Ocelli forming a more compact triangle, the front angle a right angle or slightly less; SMC2 (or SMC2 plus 3 when both are present) usually between 2 and 2.5 X as wide as high 3
 Ocelli in a broad, flat triangle, the front angle greater than a right angle; SMC2 usually more than 2.5 X as wide as high (never with three SMCs) 6
3. Head in anterior view subcircular, widest at about the middle, TFD 1.10-1.16 X VFD; vertex arched evenly above the eye tops *medianus* Banks
 Head in anterior view more transverse, less rounded above, generally widest slightly above the middle; TFD 1.13-1.20 X TFD; vertex nearly straight across or weakly arched between the eye tops 4
4. Clypeus a very narrow transverse band much wider than the lower front and measuring about 3 X as wide as high; apical front basitarsal comb-spine about as long as second segment; vertex nearly straight between eye tops *completus* Banks
 Clypeus 2.5-2.7 X as wide as high; vertex generally arched weakly, although narrow, POL much exceeding OOL; comb-spines very long and slender, the apical basitarsal spines often considerably longer than the second tarsal segment 5
5. Ocellar triangle broad, POL exceeding OOL about as 2:1; a small and apparently uncommon species confined to the deserts of Nevada, California, and Arizona *borregoensis* Evans

- Ocellar triangle more compact, POL exceeding OOL about as 5:4 or 3:2; widely distributed, Oregon and Kansas to Costa Rica *basalis* Banks
6. Antennae long and slender, third segment 4-5 X as long as thick, equal to from .64 to .80 X UID, tenth segment 2.5-3.5 X as long as thick
 *fasciatus* (Smith)
- Antennae short and compact, third segment 3.2-4 X as long as thick, equal to from .45 to .68 X UID, tenth segment 1.6-2.3 X as long as thick
 *yucatanensis* (Cameron)

Males

1. SGP broad and nearly flat, with or without a medium basal carina, the apex broadly rounded or subtruncate 2
 SGP tectiform, its median line strongly elevated for its entire length, the apex more narrowly rounded or subacute 3
2. SGP merely weakly elevated medially, more strongly toward the base, without a sharply defined carina; disc of digitus covered with clubbed setae *medianus* Banks
 SGP with a strongly defined, abruptly discontinuous median basal carina, its outer lateral angles also somewhat prominent; disc of digitus without clubbed setae *basalis* Banks
3. SMC2 of fore wing less than twice as wide as high; ventral surface of parameres more or less completely covered with small setae
 *taeniatus taeniatus* (Kohl)
- SMC2 of fore wing (or 2 plus 3 when both are present) more than twice as wide as high; ventral surface of parameres setose mainly on the apical third 4
4. SMC2 of fore wing (or 2 plus 3 when both are present) 2.0-2.5 X as wide as high; ocelli in about a right triangle or slightly less 5
 SMC2 usually more than 2.5 X as wide as high (SMC3 always absent); ocelli in a broad triangle, POL exceeding OOL, the posterior ocelli close to the rather sharp vertex crest 6
5. Apical tergite not silvery and without a white spot; SGP narrow, tapering to a subangulate apex; digiti with only some minute setae apically
 *completus* Banks
 Apical tergite silvery and with a white spot (often concealed by overlapping of preceding tergite); SGP broader and more rounded apically; digiti with some fairly long setae apically *borregoensis* Evans
6. Third antennal segment 1.3-1.6 X as long as thick, very much shorter than fourth segment; digitus with numerous straight hairs of moderate length
 *fasciatus* (Smith)
- Third antennal segment 1.6-1.8 X as long as thick, only slightly shorter than fourth segment; digitus with a number of long, sinuate hairs apically
 *yucatanensis* (Cameron)

***Aporinellus taeniatus taeniatus* (Kohl)**

- Pompilus taeniatus* Kohl, 1886, Verh. zool.-bot. Ges. Wien, 36: 315, 336 [Type: ♀, MEXICO: VERACRUZ: Orizaba (Bilimek) (Vienna Mus.; not seen by writer)]. — Cameron, 1893, Biol. Centr.-Amer., Hymen. II, p. 189.
- Pompilus taeniolatus* Dalla Torre, 1897, Cat. Hymen., VIII, p. 326.
- Aporus ferrugineipes* Viereck, 1906, Trans. Amer. Ent. Soc., 32: 203 [Type: ♀, KANSAS: Clark Co., May (F. H. Snow) (KU)].
- Aporinellus californicus* Rohwer, 1917, Proc. U. S. Nat. Mus., 53: 240 [Type: ♀, CALIFORNIA: Alameda Co., July 1907 (W. Giffard) (USNM, no. 19, 967)].
- Aporinellus banksi* Bequaert, 1919, Psyche, 26: 118, 121 [Type: ♀, TEXAS: Lee Co., May 1907 (Birkman) (MCZ, no. 10, 757)].
- Aporinellus semirufus* Banks, 1929, Psyche, 36: 326 [Type: ♀, SOUTH DAKOTA: Martin, 12 Sept. 1925 (H. C. Severin) (MCZ, no. 16, 234)]. New synonym.
- Aporinellus bequaerti* Banks, 1933, Psyche, 40: 3 [Type: ♀, TEXAS: El Paso, 11 July 1917 (JB) (MCZ, no. 17, 030)].
- Aporinellus taeniatus taeniatus* Evans, 1951, Trans. Amer. Ent. Soc., 77: 282-284.
- Aporinellus taeniatus semirufus* Evans, 1951, *ibid.*, pp. 285-286.

Some aspects of variation in this highly variable species are discussed below. It seems best to consider all Mexican and Central American material as belonging to the nominate subspecies; several other rather localized subspecies occur in the United States.

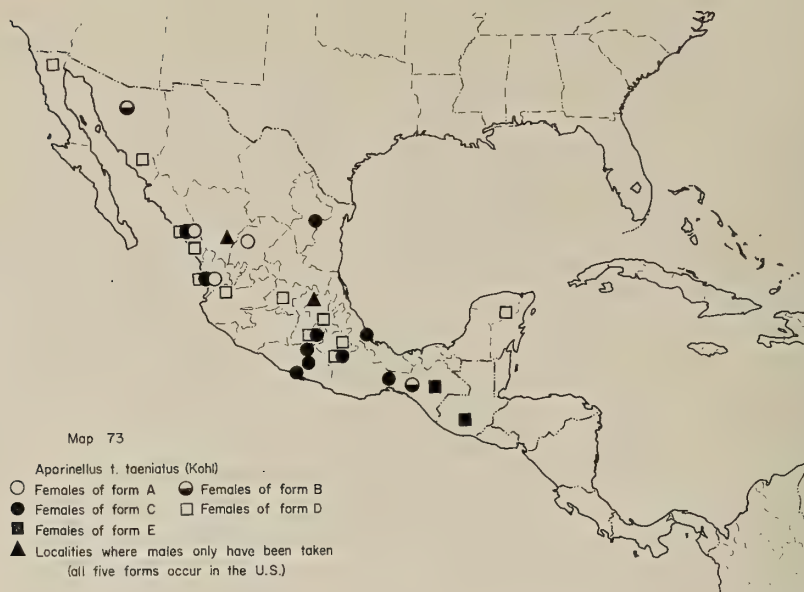
Female. — Length 4.5-8 mm. Head and thorax black, except mandibles and usually the margin of the clypeus somewhat rufous; legs varying from wholly black to almost wholly rufous; abdomen usually black, occasionally rufous; wings subhyaline, with a darker marginal band. Most specimens conspicuously patterned with silvery pubescence. Clypeus about 3 X as broad as high. POL:OOL about as 3:2. Antennae slender, third segment equal to from .6 to .9 X UID. Propodeal processes acutely pointed. Front basitarsus with either two or three comb-spines. Apical tarsal segments with from one to three minute spines beneath. Fore wing with two SMCs, the second small, less than twice as broad as high.

Male. — Length 4-7 mm. Wholly black except the mandibles yellowish in the middle, reddish at the apex; wings subhyaline, with a darker marginal band. Head and thorax extensively clothed with a heavy silvery or somewhat glaucous pubescence; abdomen with bands of pale pubescence. Front rather broad, the eyes diverging slightly above. Third antennal segment about twice as long as thick, slightly shorter than fourth segment. Venation as in female. SGP somewhat rounded apically, strongly elevated along the midline. Geni-

talia with the parameres fairly wide, the ventral surface clothed with setulae; digiti small, with a few small, straight setae; parapenial lobes rather wide (see figs. 195 and 262 in Evans, 1951).

Distribution. — British Columbia, Minnesota, and Massachusetts to Guatemala. In Mexico this species occurs from sea level on both coasts up to at least 7500 feet. (Map 73.)

Mexican and Central American specimens examined. — 79 ♀♀, 90 ♂♂. BAJA CALIFORNIA: 1 ♀, Progreso, Sierra Juarez, 5000 feet, 26 May 1956 (FXW) [CAS]. SONORA: 1 ♀, 8 mi. S Santa Ana, 11 May 1953 (RCB & EIS) [CIS]; 1 ♀, Cocorit, 11 June 1961 (FDP) [UCD]. SINALOA: 1 ♀, 13 ♂♂, Mazatlan, July, Aug. (HEE) [CU, MCZ]; 1 ♀, 1 ♂, 9 mi. E Chupaderos, 19 Mch. 1962 (FDP) [UCD]; 7 ♀♀, 4 ♂♂, 8 mi. SE Elota, 19 Apr. 1962 (FDP, LS) [UCD]. DURANGO: 4 ♂♂, Nombre de Dios, 1 Aug. 1951 (PDH) [CIS, MCZ]. ZACATECAS: 2 ♀♀, 1 ♂, 15 km. E Sombrerete, 28-31 July 1951 (HEE, PDH) [CIS, MCZ]. NUEVO LEON: 1 ♀, 10 mi. S Linares, 24 Dec. [CIS]. HIDALGO: 1 ♂, Zimapán, 11 June 1951 (HEE) [MCZ]. GUANAJUATO: 1 ♀, Salamanca, 6000 feet, 19 Aug. 1954 (RRD) [MSU]. NAYARIT: 7 ♀♀, 2 ♂♂, San Blas, Mch., July (FDP, HEE, PDH) [UCD, CIS, MCZ]; 1 ♀, 13 mi. SW Tepic, 23 Mch. 1962 (LS) [UCD]. GUERRERO: 5 ♀♀, Acapulco, 1 July 1951 (HEE, PDH) [CIS, MCZ]; 1 ♀, 20 mi. S Chilpancingo, 6 Aug. 1954, 3700 feet [KU]; 1 ♂, 10 km. E Chilpancingo, 5200 feet, 30 July 1962 (HEE) [MCZ]; 5 ♀♀, 1 ♂, Xalitla, 20 March 1959 (HEE) [CU, MCZ]; 1 ♀, 24 mi. S Iguala, 18 July 1963 (FDP) [UCD]. MORELOS: 4 ♀♀, 6 ♂♂, Huajintlan, 11 Apr. 1959 (HEE) [CU, MCZ]; 2 ♂♂, Tetecala, 25 Mch. 1959 (HEE) [CU]; 1 ♀, 8 ♂♂, Lake Tequesquitengo, 1 Apr. 1959 (HEE) [CU, MCZ]; 3 ♀♀, 3 mi. N Alpuyeca, Mch., Aug. (HEE) [CU, MCZ]; 23 ♀♀, 26 ♂♂, Cuernavaca & vic., Mch.-July (HEE, FDP) [CU, UCD, MCZ]. MEXICO: 1 ♀, 9 ♂♂, Teotihuacan Pyramids, 7500 feet, Apr., July (HEE, PDH) [CU, CIS]. PUEBLA: 1 ♀, Tehuacan, 23 June 1951 (HEE) [MCZ]; 3 ♀♀, 1 ♂, 3 mi. NW Petlalcingo, 3 Apr. 1962 (FDP, LS) [UCD]. VERACRUZ: 1 ♀, 1 ♂, Veracruz, 20 June 1951 (HEE) [MCZ]. OAXACA: 1 ♀, 23 mi. S Matias Romero, 14 Aug. 1963 (FDP, LS) [UCD]. YUCATAN: 1 ♀, Chichen Itza, 19 July 1962 (HEE) [MCZ]. CHIAPAS: 2 ♀♀, 9 ♂♂, San Cristobal las Casas, 7500 feet, 29 Apr.-1 May 1959 (HEE) [CU, MCZ]; 1 ♀, 28



mi. W Cintalapa, 9 Apr. 1962 (LS) [UCD]. GUATEMALA: 1 ♀, El Salto, Escuintla, 28 June (JB) [MCZ].

Variation. — This species would make an excellent subject for a detailed study of variation throughout its wide range, both geographically and altitudinally. Throughout the range there is a strong tendency for the formation of local races characterized by the amount of ferruginous coloration, the amount and patterning of silvery pubescence, the width of the temples, and the number of comb-spines on the front basitarsus (2 or 3). Where these races are sufficiently striking and consistent throughout a distinct portion of the range, I am inclined to use subspecific names for them (e.g., *wheeleri* in the Alleghanian fauna of eastern United States). These local races are definable chiefly in the females, the males being virtually identical throughout the range.

In Mexico and Guatemala five types of females can be identified: all black, with little silvery pubescence (form E); all black, but with extensive silvery pubescence (form D); hind legs ferruginous (form C); all legs ferruginous (form B); abdomen and all legs ferruginous (form A) (the last three forms all extensively silvery). Form A cannot be distinguished from *semirufus* Banks, which I formerly regarded

as a subspecies. However, since *semirufus* is now known from the northern Great Plains, from eastern Texas (Gillett, Austin, Bosque Co. [MCZ]), and from Mexico (Sinaloa, Nayarit, Zacatecas), in each case separated by a broad area where it is not known to occur, this form must be regarded as a polytopic subspecies or, more simply, as a color form undeserving of a trinomial. The occurrence of the various forms in Mexico and Guatemala is shown in Map 73. Two forms have been taken in one locality twice (Cuernavaca, Morelos; Petlalcingo, Puebla), three forms in one locality twice (Elota, Sinaloa; San Blas, Nayarit). The all-black form with dark pubescence (form E) occurs in the mountains of Chiapas and Guatemala, but shows up again in California. The form with wholly red legs and black body (form B) occurs in arid parts of Chiapas, in Sonora, and in various parts of southwestern United States; it may be associated with certain types of desert conditions.

Aporinellus medianus Banks

- Aporinellus fasciatus* Banks, 1912, Jour. N. Y. Ent. Soc., 19: 223, 230, 231.
 — Bequaert, 1919, Psyche, 26: 118, 121. — Evans, 1951, Trans. Amer. Ent. Soc., 77: 288-291. — Evans, 1957, Pan-Pac. Ent., 33: 185, 186. (Also *fasciatus* of various other authors.) Misidentification, not *fasciatus* of Smith (see below).
Aporinellus medianus Banks, 1917, Bull. Mus. Comp. Zool., 61: 97 [Type: ♀, CALIFORNIA: El Cajon, 1 May (E. P. VanDuzee) (MCZ, no. 10, 005)].
Aporinellus intermedius Banks, 1919, Bull. Mus. Comp. Zool., 63: 240, 241 [Type: ♀, CALIFORNIA: Claremont (C. F. Baker) (CU, no. 690)].

This is one of the commonest and most familiar species of *Aporinellus*, but unfortunately it can no longer be called by its familiar name, *fasciatus*, since this name properly applies to what has been called *apicatus* Banks. The name *medianus* was proposed by Banks to apply to a form with reduced silvery pubescence, common in parts of California. All species of *Aporinellus* which occur in these areas have reduced silvery pubescence, but the type of *medianus* happens to belong to the species generally called *fasciatus* and is the first available name for it.

Female. — Length 4-13 mm. Black, except the mandibles in part rufo-testaceous; wings subhyaline, with a darker band along the outer margin. Body typically (and in all specimens from Mexico and Central America which I

have seen) patterned with silvery and darker pubescence, the abdomen with prominent bands of silvery (California specimens generally with mostly dark pubescence, specimens from the Pacific Northwest almost wholly silvery). Head subcircular in anterior view, the vertex elevated in an even arc above the eye tops; TFD 1.10-1.16 X VFD. Clypeus 2.5-2.9 X as wide as high. MID .58-.67 X TFD; UID .75-.93 X LID; POL:OOL about as 5:4 or 5:3, the front angle of the ocellar triangle approximately a right angle. Antennal slender, third segment measuring from .67 to .97 X UID. Propodeal processes acute or narrowly rounded apically. Front basitarsus with three comb-spines, the apical one equal to or somewhat longer than second tarsal segment. Apical tarsal segments without spines beneath. Fore wing with either two or three SMCs, the second (or 2nd plus 3rd when both are present) measuring 2.0-2.7 X as wide as high, rarely over 2.5.

Male. — Length 4-8 mm. Black, except mandibles in part ferruginous and apical abdominal tergite with a white spot (sometimes concealed by overlapping of preceding tergite); wings hyaline, with a dark band along the outer margin. Body extensively patterned with silvery pubescence as in other males of the genus. UID exceeding LID; ocelli in about a right triangle, POL often slightly greater than OOL. Third antennal segment 1.5-2.0 X as long as thick, slightly shorter than fourth segment. Wings as in female. SGP broad, its median line only weakly elevated, the apex truncate or very broadly rounded (Evans, 1951, fig. 264). Genitalia with the parameres elongate, tapering apically, with more setae on the dorsal than the ventral surface; disc of digitus ovoid, oblique, covered with clubbed setae; aedoeagus slender (see Evans, 1951, fig. 196).

Distribution. — California, Wyoming, Michigan, and New York to Costa Rica. In Mexico and Central America this species occurs from sea level to about 7000 feet, but is most common at moderate altitudes (2000-6000 feet). (Map 74.)

Mexican and Central American specimens examined. — 41 ♀♀, 36 ♂♂. BAJA CALIFORNIA: 1 ♀, Descanso, 1 Sept. 1955 (RMB) [UCD]; 1 ♀, San Domingo, 23 Oct. [CAS]. SONORA: 1 ♀, 1 ♂, Aduana, Mch., May 1962 (LS) [UCD]. SINALOA: 3 ♀♀, 3 ♂♂, 8 mi. SE Elota, 19 May 1962 (FDP) [UCD]. CHIHUAHUA: 2 ♀♀, 16 mi. SE Chihuahua, 11 July 1947 (MC) [AMNH]. NUEVO LEON: 1 ♀, 4 mi. W El Cercado, 2100 feet, 6 June 1951 (HEE) [MCZ]. TAMAULIPAS: 1 ♀, Villagran, 7 June 1951 (HEE) [MCZ]; 2 ♀♀, Ciudad Victoria, Mch., June [KU, USNM]. SAN LUIS POTOSI: 1 ♀, Valles, 29 Aug. 1956 (RRD) [MSU]. VERACRUZ: 2 ♀♀, Veracruz, 28 July 1956 (RRD) [MSU]; 1 ♀, Minatitlan, 26 Aug. 1961 (RRD) [MSU]. PUEBLA: 1 ♀, 11 mi. SE Acatlan, 10 July 1952



(EG & CM) [CIS]. ZACATECAS: 1 ♀, 15 km. E Sombrerete, 28-31 July 1951 (HEE) [MCZ]. JALISCO: 1 ♂, Catalitlan, 10 July 1956 (RRD) [MSU]. MORELOS: 6 ♀♀, 10 ♂♂, Cuernavaca & vic., March-June 1959 (HEE) [CU, MCZ]; 1 ♀, 2 ♂♂, Canyon de Lobos, nr. Yautepec, 13 Mch. 1959 (HEE) [CU, MCZ]; 3 ♀♀, 7 ♂♂, Alpuyeca & vic., Mch.-June 1959 (HEE) [CU, MCZ]; 1 ♀, Xochicalco, 13 July 1961, 4000 feet (RRD) [MSU]; 1 ♂, 6 mi. S Temixco, 30 Mch. 1962 (LS) [UCD]; 2 ♀♀, Las Estacas, 3000 feet, 6 Apr. 1959 (HEE) [CU, MCZ]; 1 ♂, Tetecala, 3500 feet, 25 Mch. 1959 (HEE) [CU]; 1 ♀, 22 mi. S Cuernavaca, 4000 feet, 10 Sept. 1959 (HAS) [OSU]. GUERRERO: 2 ♂♂, 16 km. E Chilpancingo, 4700 feet, 30 July 1962 (HEE) [MCZ]. OAXACA: 2 ♀♀, 1 ♂, 23 mi. S Matias Romero, 6 Apr. 1962 (FDP) [UCD]. CHIAPAS: 1 ♂, 5 mi. E Cintalapa, 3 Apr. 1953 (RCB & EIS) [CIS]. HONDURAS: 1 ♂, La Ceiba, 18 Sept. 1916 (F. J. Dyer) [USNM]; 1 ♂, Dakota Farm, Tela, 2 May 1923 (T. H. Hubbell) [RRD]. EL SALVADOR: 1 ♀, San Salvador, 12 July 1949 (KWC) [USNM]; 1 ♀, Los Chorros, 20 June 1963 (M. Irwin) [UCD]; 1 ♀, 3 ♂♂, Quesaltepeque, June, July 1963 (M. Irwin) [UCD]. COSTA RICA: 1 ♂, Limon, 15 Feb. 1964 (HEE) [MCZ]; 3 ♀♀, Bebedero, Guanacaste

Prov., 26 Feb. 1964 (HEE) [MCZ]; 1 ♀, 12 mi. SW Cañas, 27 Feb. 1964 (HEE) [MCZ].

Aporinellus basalis Banks

Aporinellus basalis Banks, 1933, Psyche, 40: 3 [Type: ♀, ARIZONA: Tempe (JB) (MCZ, no. 17, 031)]. — Evans, 1951, Trans. Amer. Ent. Soc., 77: 293 (erroneously placed in synonymy with *completus* Banks).

Aporinellus bridwelli Evans, 1951, *ibid.*, pp. 291-292 [Type: ♂, KANSAS: Clay Co., Aug. 1901 (J. C. Bridwell) (USNM, no. 61, 072)]. — Evans, 1957, Pan-Pac. Ent., 33: 185, 186. New synonym.

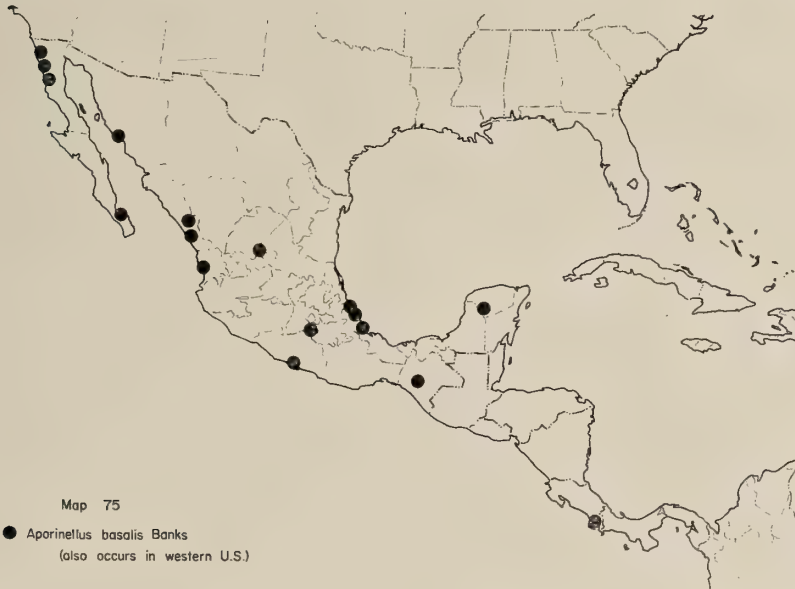
Although I correctly identified the female of *bridwelli* in 1957, I failed to recognize that it was the same as Banks' *basalis*, a name which has priority over *bridwelli*.

Female. — Length 4-9 mm. Black, except mandibles in part ferruginous; wings hyaline, with a prominent dark band along the outer margin. Body strongly patterned with silvery pubescence except in some California and Baja California specimens (see below). Head, in anterior view, somewhat transverse, widest slightly above the middle of the eyes, the top of the head less strongly rounded than in *medianus*; TFD 1.13-1.17 X VFD; MID .56-.62 X TFD; UID .80-.90 X LID. Clypeus 2.5-2.7 X as wide as high. Ocelli in about a right triangle or slightly less; POL:OOL about as 5:4 or 3:2. Antennae slender, third segment equal to .70-.90 X UID. Propodeal processes small, acute. Front basitarsus with three extremely slender, delicate comb-spines, the apical one in most specimens considerably longer than the second tarsal segment. Fore wing with two or three SMCs, the second (or second plus third when both are present) 2.0-2.5 X as wide as high.

Male. — Length 3.5-7.0 mm. Black, mandibles in part ferruginous; wings hyaline, darker along outer margin. Body strongly patterned with silvery pubescence as usual in this genus, the basal four abdominal tergites strongly banded but the remainder of the abdomen dark (apical tergite rarely silvery, never with a white spot as in *medianus*). UID slightly exceeding LID; front angle of ocellar triangle a right angle or slightly less, POL usually slightly exceeding OOL. Third antennal segment about twice as long as thick, slightly shorter than fourth segment. Wings as in female. SGP broad, nearly flat except for a strong median carina which terminates abruptly at some distance from the apex; apex broadly rounded or subtruncate, the sides usually rather prominently thickened, often somewhat polished. Genitalia with the parameres elongate, somewhat less pointed apically than in *medianus*, disc of digitus small, bearing some fairly long apical setae which are straight or nearly so (see Evans, 1951, fig. 197).

Distribution. — Texas, Kansas, and Oregon to Costa Rica. In Mexico this species is common on both coastal plains but has been taken inland only occasionally. (Map 75.)

Mexican and Central American specimens examined. — 46 ♀♀, 37 ♂♂. BAJA CALIFORNIA: 2 ♀♀, Descanso, 1 Sept. 1955 (RMB) [UCD]; 1 ♀, 4 mi. SW La Zapopita, Valle de Trinidad, 16 April 1961 (F. X. Truxal) [LACM]; 2 ♀♀, 1 ♂, 10 mi. E Bahia San Quintin, May, Sept. (FXW) [CAS]; 1 ♀, La Paz, 6 Oct. 1955 (FXW) [CAS]. SONORA: 1 ♀, Guaymas, 24 Sept. 1923 (W. M. Mann) [USNM]. SINALOA: 5 ♀♀, 14 ♂♂, Mazatlan, May, July, Aug. (FDP, LS, HEE) [CU, MCZ, USNM, UCD]; 6 ♀♀, 12 ♂♂, 8 mi. SE Elota, 19 May 1962 (FDP, LS) [UCD]; 1 ♂, 9 mi. E Chupaderos, 19 Mch. 1962 (LS) [UCD]. ZACATECAS: 2 ♀♀, 9 mi. N Ojo Caliente, 12 May 1962 (FDP) [UCD]. NAYARIT: 3 ♀♀, 2 ♂♂, San Blas, 20 July 1951 (HEE) [MCZ]. GUERRERO: 2 ♀♀, Acapulco, 1 July 1951 (HEE) [MCZ]. MORELOS: 1 ♀, 2 ♂♂, Huajintlan, 2800 feet, 11 Apr. 1959 (HEE) [MCZ]; 1 ♀, 5 mi. E Cuernavaca, 28 Mch. 1962 (LS) [UCD]. VERACRUZ: 6 ♀♀, 2 ♂♂, Tecolutla, June (HEE, PDH, CDM) [MCZ, CIS, KU]; 1 ♂, 16 mi. S Tecolutla, 26 June 1953 [KU]; 8 ♀♀, 2 ♂♂, Veracruz, June, July (HEE, PDH, RRD) [MCZ, CIS, MSU]; 1 ♀, 5 mi. NE



Tinajas, 18 Aug. 1963 (FDP) [UCD]. CHIAPAS: 2 ♀♀, Tuxtla Gutierrez, about 1000 feet, 24 Apr. 1959 (HEE) [CU, MCZ]. YUCATAN: 1 ♀, 25 mi. S Merida, 13 Aug. 1963 (HAS) [OSU]. COSTA RICA: 1 ♀, Golfito, 20 July 1957 (AM) [LACM].

Variation. — The female from La Zapopita, Baja California, has the pubescence wholly dark except for a very small amount of pale on the lower front and base of the mandibles. One of the females from near Bahia San Quintin also shows some reduction in the pale pubescence, as do some California specimens, but there are at least weak silvery bands on the basal abdominal tergites. All other specimens show a complete or nearly complete pattern of silvery pubescence. There is considerable variation in the shape of the SGP and the length of the median carina, but this variation seems to bear no noteworthy correlation with distribution.

Aporinellus completus Banks

Aporinellus completus Banks, 1917, Bull. Mus. Comp. Zool., 61: 97 [Type: ♀, WASHINGTON: Lone Tree, Yakima River, 30 June 1882 (MCZ, no. 10, 004)]. — Bequaert, 1919, Psyche, 26: 118, 121. — Evans, 1951, Trans. Amer. Ent. Soc., 77: 292-295. — Evans, 1957, Pan-Pac. Ent., 33: 186.

Female. — Length 5-8 mm. Color of body, wings, and pubescence as described for *medianus*; all Mexican specimens seen fully patterned with pale pubescence, the abdomen banded. Head distinctly broader than high, TFD 1.15-1.20 X VFD, the top of the head weakly rounded, the vertex nearly straight between the eye tops. Clypeus a transverse band approximately 3 X as wide as high. MID .56-.62 X TFD; UID .76-.90 X LID; POL:OOL about as 5:4. Antennae slender, third segment equal to from .70-.88 X UID. Propodeal processes small, acute or narrowly rounded. Front basitarsus with three comb-spines, the apical one about as long as the second tarsal segment. Fore wing with either two or three SMCs, the second (or 2nd plus 3rd when both are present) 2.0-2.5 X as wide as high.

Male. — Length 3.5-7.0 mm. Color of body, wings, and pubescence as in *basalis*, the apical tergite without a white spot or pale pubescence. Front angle of ocellar triangle a right angle or slightly less. Third antennal segment about twice as long as thick, slightly shorter than fourth segment. SGP narrow, its median line strongly elevated, the apex more acute than in other members of the genus and the margin provided with stout setae. Genitalia with the parameres long, slightly curved, slender and attenuate; digiti capitate, disc with only a few small, simple setae; aedoeagus and parapenial lobes of moderate breadth (see fig. 198 in Evans, 151).



Distribution. — Transcontinental in southern Canada and the United States; also ranging south to southern Mexico, but in central and southern Mexico mainly at moderate to fairly high altitudes (5000-7500 feet). (Map 76.)

Mexican specimens examined. — 33 ♀♀, 32 ♂♂. BAJA CALIFORNIA: 1 ♂, 220 km. S Tijuana, 9 Sept. 1955 (FXW) [CAS]. COAHUILA: 1 ♀, 1 ♂, 23 mi. N Saltillo, 11 Aug. 1959 (LS & AM) [UCD]. DURANGO: 1 ♀, 8 mi. S Canutillo, 9 Aug. 1951 (HEE) [MCZ]; 1 ♀, 3 ♂♂, Nombre de Dios, 6 Aug. 1951 (HEE, PDH) [MCZ, CIS]; 1 ♀, 5 mi. W Durango, 14 May 1962 (FDP) [UCD]. ZACATECAS: 4 ♀♀, 5 ♂♂, 15 km. E Sombrerete, 28-31 July 1951 (HEE, PDH) [MCZ, CIS]. JALISCO: 2 ♀♀, Guadalajara, 12 July 1959, 5000 feet (HEE) [CU]. GUANAJUATO: 1 ♂, Yuriria, 6500 feet, 7 Aug. 1962 (HEE) [MCZ]. QUERETARO: 1 ♀, Palmillas, 8 Aug. 1962 (HEE) [MCZ]. HIDALGO: 1 ♀, Zimapán, 11 June 1951 (HEE) [MCZ]; 1 ♀, 4 mi. W Pachuca, 7900 feet, June [KU]. MEXICO: 3 ♀♀, 7 ♂♂, Teotihuacan Pyramids, 7500 feet, April, June, July (HEE) [CU, MCZ]; 3 ♀♀, 2 ♂♂, Valle de Bravo, 6500 feet, 3 Aug. 1962 (HEE) [MCZ]. PUEBLA: 1 ♀, Tehuacan, 23 June 1951 (HEE) [MCZ]. MORELOS: 1 ♀, 30-40 km. NE Cuen-

navaca, 7-8000 feet, 31 July 1962 (HEE) [MCZ]; 9 ♀♀, 10 ♂♂, Cuernavaca & vic., 6000-7500 feet, April-June 1959 (HEE) [CU, MCZ]. CHIAPAS: 1 ♀, 1 ♂, Nachic, 8000 feet, 27 April 1959 (HEE) [CU]; 2 ♀♀, San Cristobal las Casas, 28 April 1959 (HEE) [CU, MCZ]; 1 ♂, 8 mi. W Navenchauc, 1 April 1953 (RCB & EIS) [CIS].

Aporinellus fasciatus (Smith)

Aporus fasciatus Smith, 1855, Cat. Hymen. Brit. Mus., III, p. 175 [Type: ♂, SOUTH CAROLINA: Warm Springs (E. Doubleday) (BMNH, no. 19, 753)].

Pompilus unionis Dalla Torre, 1897, Cat. Hymen., VIII, p. 330 (n. name for *fasciatus*, preoccupied in *Pompilus*).

Aporus apicatus Banks, 1910, Jour. N. Y. Ent. Soc., 18: 126 [Type: ♂, CALIFORNIA: Claremont (C. F. Baker) (MCZ, no. 13, 721)]. New synonym.

Aporinellus apicatus Banks, 1912, Jour. N. Y. Ent. Soc., 19: 230. — Evans, 1951, Trans. Amer. Ent. Soc., 77: 295-297 (♂ only).

Aporinellus sinuatus Evans, 1951, *ibid.*, pp. 298-299 (♀ only; sexes incorrectly associated).

The type of *fasciatus* is in reasonably good condition, and I have studied it in detail, including the genitalia. There is no question that it represents the species which has usually been called *apicatus* Banks. I am now convinced that what I formerly considered to be the female of this species (*laticeps* Banks) is actually the female of the species which follows.

Female. — Length 6.5-12 mm. Color of body, wings, and pubescence as described for *medianus*. Clypeus 2.6-2.7 X as wide as high. Front broad, MID .59-.64 X TFD; inner orbits convergent above, UID .80-.98 X LID. Ocelli in a broad, flat triangle, POL:OOL about as 3:2. Antennae long and slender, about as in *medianus*, the third segment 4-5 X as long as its maximum thickness, measuring from .64 to .80 X UID; outer antennal segments also quite slender, segment ten 2.5-3.5 X as long as thick. Vertex arched weakly above the eye tops. Propodeal processes large, in lateral aspect rounded. Spines of the tarsal comb long and slender, the apical spine on the basitarsus slightly longer than the second tarsal segment. Fore wing with only two SMCs, the second varying from 2.3 to 3.2 X as wide as high (fig. 23).

Description of male holotype. — Length 9 mm.; fore wing 6 mm. Black, except mandibles ferruginous apically, apical abdominal tergite with a white spot; wings subhyaline, fore wing with a fuscous apical band. Head and thorax in large part silvery-sericeous, brownish on parts of the dorsum; basal parts of

legs silvery, also upper surfaces of tibiae and basitarsi; basal four abdominal segments with strong apical silvery bands (basal three sternites actually wholly silvery), remainder of abdomen with dark pubescence except apical tergite with coarse silvery pubescence. Clypeus 2.3 X as wide as high. Front broad, MID .64 X TFD, 1.4 X LID; UID 1.07 X LID. Ocelli in a broad triangle, the posterior ocelli close to the rather sharp vertex crest; POL:OOL = 11:8. First four antennal segments in a ratio of about 16:5:10:14, segment three 1.45 X as long as thick. Fore wing with the marginal cell removed from the wing tip by 1.6 X its own length; SMC2 2.9 X as wide as high, narrowed by more than half above. SGP tectiform, rounded apically. Genitalia with slender, attenuate parameres which much exceed the other appendages; digits with the apical part rather small, rounded, with a few fairly long, straight setae extending upward and a number of downward-directed setae on the disc; parapenial lobes and aedoeagus unusually broad (the genitalia of the type agree very well with the figure presented for *apicatus* by Evans, 1951, fig. 200).

Distribution. — This species ranges from North Carolina, Illinois, Alberta, and British Colombia to Florida and central Mexico. In central Mexico it occurs chiefly at moderate altitudes, 3400-7500 feet. (Map 77.)

Mexican specimens examined. — 10 ♀♀, 21 ♂♂. BAJA CALIFORNIA: 2 ♀♀, Mouth of Rio Santelmo, 21 Sept. [CAS]; 1 ♂, km. 220 S Tijuana, 11 Sept. 1955 (FXW) [CAS]. SINALOA: 1 ♀, 1 ♂, 8 mi. SE Elota, 19 May 1962 (FDP) [UCD]. DURANGO: 2 ♂♂, 10 mi. W Durango, 12 July 1954 (EIS) [CIS]; 1 ♀, 5 mi. W Durango, 14 May 1962 (FDP) [UCD]. NAYARIT: 1 ♀, 18 mi. S Tepic, 7 July 1963 (FDP, LS) [UCD]. JALISCO: 1 ♀, 1 ♂, Guadalajara, 5000 feet, 16-24 July 1951 (HEE) [MCZ]; 1 ♂, Villa Guadalupe, 26 July 1951 (HEE) [MCZ]. MEXICO: 1 ♀, Teotihuacan Pyramids, 7500 feet, 7 July 1951 (HEE) [MCZ]. PUEBLA: 1 ♀, 3 mi. NW Petlalcingo, 2 Apr. 1962 (FDP) [UCD]. MORELOS: 1 ♀, 8 ♂♂, Cuernavaca & vic., April 1959, 4500-6000 feet (HEE) [CU, MCZ]; 1 ♀, 7 ♂♂, Alpuyeca & vic., 3400 feet, April, May, July (HEE, PDH) [CU, MCZ, CIS].

Variation. — All available specimens of both sexes have only two SMCs in the fore wing, SMC2 varying from 2.3-3.2 X as wide as high. All the available Mexican females are fully patterned with pale pubescence, except those from Baja California, which have much more limited pale pubescence, like those from Southern California. The males vary in size from 5 to 10 mm.; MID varies from .66 to .74 X TFD, UID from 1.05 to 1.30 X LID. There is some variation



in the details of the patterning of the pubescence, also in the length of the third antennal segment, although this is always much shorter than the fourth segment and never more than about 1.6 X as long as thick.

Aporinellus yucatanensis (Cameron) new combination

Pompilus (*Aporus*) *yucatanensis* Cameron, 1893, Biol. Centr.-Amer., Hymen. II, p. 189 [Type: ♀, MEXICO: YUCATAN: No. part (Gaumer) (BMNH, no. 19, 752)].

Pompilus yucatanensis Dalla Torre, Cat. Hymen., VIII, p. 336.

Aporinellus laticeps Banks, 1912, Jour. N. Y. Ent. Soc., 19: 230, 231 [Type: ♀, COLORADO: Boulder (S. A. Rohwer) (USNM, no. 21, 122)]. — Bequaert, 1919, Psyche, 26: 118, 122. New synonym.

Aporinellus apicatus Evans, 1951, Trans. Amer. Ent. Soc., 77: 295-297 (♀ only; sexes misassociated).

Aporinellus sinuatus Evans, 1951, *ibid.*, pp. 298-300 [Type: ♂, TEXAS: Limpia Canyon, Davis Mts., 14-22 July 1948 (HEE) (ANSP)]. — Krombein, 1958, U. S. Dept. Agri., Monogr. 2, First Suppl., p. 185. New synonym.

Another unfortunate change in names and sex associations is involved here, as Cameron's *yucatanensis* is indubitably the same as

Banks' *laticeps* and what I formerly believed to be the female of *apicatus*, but which I now regard as the female of "*sinuatus*". This species averages somewhat smaller than the preceding and is apparently somewhat more fully adapted for high temperatures, although the two species have often been taken at the same localities.

Description of type female. — Length 7 mm.; fore wing 5 mm. Black, except the mandibles ferruginous apically; wings subhyaline, fore wings with a strong apical dark band. Body extensively ornamented with pale pubescence as usual in this genus, the abdomen with strong apical bands of pale pubescence on T1-4. Clypeus 3 X as wide as high. Front broad, MID .62 X TFD, 1.2 X LID; UID .90 X LID. Ocelli in a broad triangle, POL:OOL = 11:9. First four antennal segments in a ratio of about 18:6:18:15, segment three 3.3 X as long as thick, .58 X UID; segment ten 1.9 X as long as thick. Vertex elevated in an even arc above the eye tops. Lateral processes of propodeum narrowly rounded in lateral view. Front basitarsus with three slender comb-spines, the apical one about equal in length to the second segment. Fore wing with two SMCs, the second 2.9 X as wide as high, narrowed by two-thirds above.²⁹

Male. — Length 3.5-8 mm. Color of body, wings, and pubescence as described for *fasciatus*. Clypeus 2.2-2.4 X as wide as high. MID .64-.72 X TFD; UID much exceeding LID; POL:OOL about as 5:4. First four antennal segments in a ratio of about 25:10:18:20, segment three thus only slightly shorter than fourth segment, measuring from 1.5 to 1.8 X as long as thick. Wings as in female, SMC2 varying from about 2.4 to 3.0 X as wide as high. SGP tectiform, obtusely angulate apically, the margin beset with strong spines. Genitalia with the parameres rather long, but subtruncate or bluntly rounded apically; disc of digitus slightly broader than in *fasciatus*, bearing a few clubbed setae toward the inner margin and several long, sinuate setae apically; parapenial lobes and aedoeagus not quite as broad as in *fasciatus* (see fig. 199 in Evans, 1951).

Distribution. — In the United States, north to New Jersey, Iowa, Montana, and Oregon; also throughout much of Mexico except at high altitudes, and south to Costa Rica. (Map 78.)

Mexican and Central American specimens examined. — 38 ♀♀, 57 ♂♂. BAJA CALIFORNIA: 1 ♀, 20 mi. N Mesquital, 27 Sept. [CAS]; 1 ♀, El Tajo Canyon, Sierra Juarez Mts., 12 Sept. 1958 (J. R. Northern) [LACM]. SINALOA: 1 ♂, Teacapan, 29 June 1956 (RRD) [MSU]; 1 ♂, Villa Union, 17 Aug. 1962 (HEE) [MCZ];

²⁹ Details regarding the front tarsi and apical parts of the antennae were added from a specimen from Merida, Yucatan, extremely similar to the type, which is lacking these parts.

1 ♀, Mazatlan, 15 Aug. 1962 (HEE) [MCZ]; 1 ♂, 8 mi. SE Elota, 19 May 1962 (FDP) [UCD]. DURANGO: 1 ♂, Nombre de Dios, 1 Aug. 1951 (PDH) [CIS]; 1 ♂, 5 mi. W Durango, 14 May 1962 (FDP) [UCD]. NUEVO LEON: 1 ♀, 50 mi. SE Monterrey, 1700 feet, 13 Oct. 1957 (HAS) [OSU]. TAMAULIPAS: 1 ♀, Villagran, 7 June 1951 (HEE) [MCZ]. SAN LUIS POTOSI: 1 ♀, 5 mi. E Ciudad del Maiz, 23 Aug. 1954 (RRD) [MSU]. AGUASCALIENTES: 1 ♀, 5 mi. E Cavillo, 26 Oct. 1950 (RFS) [AMNH]. JALISCO: 1 ♀, Villa Guadalupe, 25 July 1951 (PDH) [CIS]; 2 ♀ ♀, Guadalajara, July (HEE) [MCZ]. GUERRERO: 1 ♀, 18 mi. S Iguala, 18 July 1963 (FDP) [UCD]. MORELOS: 3 ♀ ♀, 14 ♂ ♂, Canyon de Lobos, nr. Yautepec, 7-18 Mch. 1959 (HEE) [CU, MCZ]; 10 ♀ ♀, 12 ♂ ♂, Cuernavaca & vic., Mch.-June, 4500-7500 feet (HEE, FDP) [CU, MCZ, UCD]; 2 ♀ ♀, 14 ♂ ♂, 3 mi. N Alpuyeca, 3400 feet, Mch.-Apr. 1959 (HEE) [CU, MCZ]; 1 ♀, Tetecala, 3500 feet, 25 Mch. 1959 (HEE) [MCZ]; 1 ♀, 2 ♂ ♂, 6 mi. S Temixco, 30 Mch. 1962 (LS, FDP) [UCD]. VERACRUZ: 1 ♀, 5 mi. E Acultzingo, 5000 feet, 15 June 1959 (HEE) [MCZ]; 2 ♀ ♀, 2 ♂ ♂, Veracruz, June, July, Dec. (HEE, PDH, RRD) [MCZ, CIS, MSU]; 2 ♀ ♀, 1 ♂, Minatitlan, 26 Aug. 1961 (RRD) [MSU]. CAMPECHE: 2 ♀ ♀, 3



♂ ♂, 10 mi. N Hopelchen, 17 Apr. 1962 (LS, FDP) [UCD]. YUCATAN: 1 ♀, No. part [type, BMNH]; 1 ♀, 1 ♂, Merida, 25 July 1962 (HEE) [MCZ]. GUATEMALA: 1 ♂, Guatemala City, 5000 feet, 15 June 1947 (C. & P. Vaurie) [AMNH]. HONDURAS: 1 ♀, 20 mi. from Tegucigalpa (TDA Cockerell) [MCZ]. COSTA RICA: 1 ♂, Santa Ana, San José Prov., 3000 feet, 24 Feb. 1964 (HEE) [MCZ].

Variation. — As usual in this genus, Baja California females, like those from much of California, have the silvery pubescence greatly reduced; one female before me from Tulare Co., Calif., has the pubescence dark over the entire thorax and abdomen. The females vary in size from 5.5 to 10 mm.; MID varies from .60 to .66 X TFD, UID from .85 to 1.0 X LID. The antennae show only slight variation in length, the third segment varying from 3.2 to 4.0 X as long as thick, from .45 to .68 X UID, the tenth segment from 1.6 to 2.3 X as long as thick. In other characters there is no significant variation from the condition in the type, described above.

Genus *ALLOCHARES* Banks

Allochaes Banks, 1917, Bull. Mus. Comp. Zool., 61: 98 [Type species: *Allochaes bruesi* Banks (= *azureus* Cresson), monobasic]. — Bradley, 1944, Trans. Amer. Ent. Soc., 70: 148-150. — Evans, 1951, Trans. Amer. Ent. Soc., 77: 301-304.

Generic characters. — Length 6-14 mm.; color black, pubescence reflecting bluish or violaceous. Body devoid of erect hair, even the abdomen of the female. Head rather strongly convex in front and somewhat concave behind, especially in the male. Mandibles without setae and without a setigerous groove beneath; inner margin with a single tooth. Malar space well developed, half or more as long as the width of the mandibles at their base; temples not well developed. Labrum not exerted; clypeus convex, rounded or subtruncate below; ocelli small, in a very broad triangle; antennae of moderate length, third segment in the female equal to at least .8 X UID, in the male at least 1.5 X as long as thick. Pronotum rather long, on the midline nearly as long as the mesoscutum; postnotum a narrow band which is somewhat widened on the mid-dorsal line; propodeum strongly impressed medially and with its sides produced behind into strong conical processes. Legs unusually smooth and devoid of spines, especially in the female, which lacks a tarsal comb and has in fact only a few minute spines on any of the legs; pulvillar pad large, but the comb very weak; claws all dentate and weakly so, except the inner claws of the front tarsus of the male strongly curved, bifid, the apical tarsal segment also slightly lobed on the inner margin. Fore wing with the basal and transverse median veins interstitial or nearly so; marginal cell large, less than its own length from

the wing tip; SMC2 and 3 both four-sided; anal vein of hind wing curving up to meet the media somewhat before the origin of the cubitus. First two abdominal segments rather long in both sexes, the remaining segments shorter and tending to telescope within the basal two, especially in the male; male SGP strongly compressed, consisting of two flaps which are folded against one another; male genitalia with slender parameres, the aedoeagus simple, the basal hooklets absent.

Distribution. — This monotypic genus occurs in the Sonoran sub-region of the Nearctic region. It has no close relatives, but may represent a relic of the stock which gave rise to *Homonotus* and related Old World genera.

Allochaes azureus (Cresson)

Pompilus (*Agenia*) *azureus* Cresson, 1867, Trans. Amer. Ent. Soc., 1: 131 [Type: ♀, MEXICO: VERACRUZ: Veracruz (C. Sartorius) (ANSP, no. 472)]. — Cresson, 1869, Proc. Boston Soc. Nat. Hist., 12: 372.

Pseudagenia azurea Kohl, 1884, Verh. zool.-bot. Ges. Wien, 34: 42. — Cameron, 1891, Biol. Centr.-Amer., Hymen. II, p. 167. — Dalla Torre, 1897, Cat. Hymen., VIII, p. 198.

Pompilus sinaloa Cameron, 1893, Biol. Centr.-Amer., Hymen. II, p. 192 [Type: ♀, MEXICO: SINALOA: Presidio de Mazatlan (Forrer) (BMNH, no. 19, 690)]. — Dalla Torre, 1897, Cat. Hymen., VIII, p. 323. Synonymy by Bradley, 1944.

Allochaes bruesi Banks, 1917, Bull. Mus. Comp. Zool., 61: 98 [Type: ♀, TEXAS: Austin (C. T. Brues) (MCZ, no. 10, 006)]. Synonymy by Bradley, 1944.

Allochaes azureus Bradley, 1944, Trans. Amer. Ent. Soc., 70: 149. — Evans, 1951, Trans. Amer. Ent. Soc., 77: 302-304.

Female. — Length 9-14 mm. Black; pubescence violaceous except cinereous on the front and on much of the legs; front wings moderately infuscated, darker apically; hind wings subhyaline, darker apically. Clypeus about twice as broad as high, subtruncate below; MID .54-.60 X TFD; UID subequal to or slightly less than LID; POL much exceeding OOL; third antennal segment equal to from .8 to 1.2 X UID. Pronotum arcuate behind, with a weak angulation on the midline.

Male. — Length 6-10 mm. Black; pubescence strongly bluish or violaceous except silvery on the head, coxae, and lower pleura, sometimes over much of the thorax; wings subhyaline, darker apically. Clypeus 1.5-1.8 X as broad as high, rounded below; front strongly gibbous above the antennal sockets; UID considerably exceeding LID; third antennal segment somewhat shorter than fourth segment. Pronotum broadly subangulate behind. SGP strongly compressed, when flattened out seen to possess an apical V-shaped



emargination. Genitalia with slender parameres, digiti elongate, clothed with short setae but with some strong, partly clubbed setae at their base (see fig. 193 in Evans, 1951).

Distribution. — This species ranges throughout much of Mexico, from sea level to about 7500 feet, also north to southern California, Arizona, Texas, and east to Florida. See Evans, 1951, for U. S. records. (Map 79.)

Mexican specimens examined. — 12 ♀♀, 4 ♂♂. 3 ♀♀, 1 ♂, without further locality data [ANSP, Univ. Halle]. SONORA: 1 ♀, Dec. [USNM]. CHIHUAHUA: 1 ♂, Arroyo Mesteno, Sierra del Nido, 7600 feet, 21 July 1959 (W. C. Russell) [CIS]. SINALOA: 1 ♀, Mazatlan (Forrer) [BMNH]; 1 ♀, Chupaderos, 3 July 1963 (FDP, LS) [UCD]. NAYARIT: 1 ♂, San Blas, 17-21 Sept. 1953 (B. Malkin) [CAS]. JALISCO: 1 ♀, 42 mi. SE Guadalajara, 25 May 1956 (HAS) [OSU]. COLIMA: 1 ♀, Volcan de Colima [CU]. MEXICO: 1 ♀, Teotihuacan Pyramids, 7 July 1951, about 7500 feet (HEE) [MCZ]. SAN LUIS POTOSI: 1 ♀, 18 mi. SW San Luis Potosi, 7300 feet, 2 Oct. 1957 (HAS) [OSU]. PUEBLA: 1 ♂, Acatlan, 30 Sept. 1961 (FPM) [ENAC]; 1 ♀, Cacaloapan, 26 Apr. 1962 (LS) [UCD]. VERACRUZ: 1 ♀, Veracruz (Sartorius) [ANSP].

Genus **PARACYPHONONYX** Gribodo

- Paracyphononyx* Gribodo, 1884, Ann. Mus. Civ. Stor. Nat. Genova, (2)1: 306 [Type species: *Paracyphononyx melanicus* Gribodo (= *ruficus* Klug), monobasic]. — Arnold, 1936, Ann. Transvaal Mus., 18: 428-446 (African spp.). — Evans, 1951, Trans. Amer. Ent. Soc., 77: 304-308 (U. S. spp.).
- Schistosalius* Saussure, 1892, Grandidier's Nat. Hist. Madagascar, XX, Hymen. I, p. 313 [Type species: *Salius ellioti* Saussure, designated by Ashmead, 1902].
- Paracyphonyx* Ashmead, 1902, Canad. Ent., 34: 81 [Type species: *Paracyphonyx metemmensis* Magretti, monobasic]. — Banks, 1934, Proc. Amer. Acad. Arts & Sci., 69: 84, 86.
- Allocyphonyx* Ashmead, 1902, Canad. Ent., 34: 136 [Type species: *Pompilus maurus* Cresson (= *funereus* Lepeletier), monobasic]. — Bradley, 1944, Trans. Amer. Ent. Soc., 70: 150. — Banks, 1947, Bull. Mus. Comp. Zool., 99: 436-445 (So. American spp.).
- Pompiloides* Suster, 1913, Verh. zool.-bot. Ges. Wien, 62: 180, 203 [Type species: *Pompilus ruficus* Klug, monobasic].
- Dicyrtomus* Haupt, 1927, Deutsch. Ent. Zeitschr., Beiheft, p. 150, 256 [Type species: *Pompilus ruficus* Klug, original designation].
- Atopopompilus* Arnold, 1937, Ann. Transvaal Mus., 19: 22-24 [Type species: *Pompilus venans* Kohl, original designation]. — Banks, 1947, Bull. Mus. Comp. Zool., 99: 442 (made subgenus of *Allocyphonyx*).
New synonym.
- Anacyphonyx* Haupt, 1950, Explor. Parc. Nat. Albert, Miss. de Witte, Fasc. 69, p. 59 [Type species: *Pompilus semiplumbeus* Taschenberg, original designation]. New synonym.

Generic characters. — Wasps of medium size, 6 to 20 mm. Coloration, pubescence, and pilosity variable, but males always with dense, erect pubescence on the propodeal declivity. Head attached to the thorax rather low; head thin, temples not developed. Labrum fully exposed, semicircular. Malar space well developed in males (about as long as or longer than antennal pedicel), often well developed in females. Antennae elongate, males with the antennae strongly crenulate in profile beyond the third segment. Scutellum very prominent; postnotum slightly expanded on each side of the mid-dorsal line; propodeum with an oblique declivity, the sides of which are sometimes prominent. Legs strongly spinose; but female without a tarsal comb. Ultimate tarsal segments with or without spines beneath. Claws bifid in both sexes, the inner ray rather broad, truncate; pulvillar comb of from 6 to 12 setulae; inner claw of front tarsus of male more strongly curved than outer claw, apical segment of front tarsus of male modified or not. Fore wing with the stigma small; radial vein somewhat angled at the third intercubital vein; SMC3 strongly narrowed above, often triangular or petiolate; hind wing with the anal vein approximately interstitial with the cubitus (fig. 24). Apex of abdomen of

female somewhat compressed, the apical sternite especially so and covered with thin setae. Male genitalia with the basal hooklets single; parameres very large, much exceeding the other appendages, often expanded apically and usually fringed with long setae, without a distinct squama; aedoeagus often with small setae (fig. 54).

Distribution. — Tropics and warm temperate regions throughout the world; in the Americas from Argentina to northern United States, excluding the West Indies.

Remarks. — The various species of this genus often differ by characters elsewhere considered of generic value, for example, the presence of absence of spines beneath the apical tarsal segments, the shape of the propodeum, and the length of the malar space. It is possible that some of the names listed in the synonymy above may someday be used for subgenera, but this will require a detailed study and comparison of the Neotropical and Old World species. The three species occurring in Mexico and Central America might easily each be placed in a separate subgenus, and subgeneric names are available for each (*Alloocyphonyx* for *funereus*, *Atopopompilus* for *unicolor*, and *Anacyphononyx* for *semitlumbeus*). However, I see no advantage in doing this at this time. Bradley (1944) gave *Alloocyphonyx* tribal rank, but for some reason ignored the Neotropical species in a work purported to cover all the Americas.

Key to Species

Females

1. Pronotum with a yellowish stripe along its posterior margin; abdomen rufous; head and thorax in large part clothed with a heavy whitish pubescence; malar space well developed; ultimate tarsal segments spined beneath *semitlumbeus* (Taschenberg)
Body entirely black, with or without a limited pattern of fine, pale pubescence; malar space short, or ultimate tarsal segments smooth beneath .. 2
2. Malar space very short, practically absent; ultimate tarsal segments with a median row of spines beneath *unicolor* (Smith)
Malar space nearly or quite as long as antennal pedicel; ultimate tarsal segments not spined beneath *funereus* (Lepeletier)

Males

1. Antennae weakly crenulate in profile beyond segment four, the segments

- rounded below; abdomen partly or wholly rufous; SGP more or less irregular, often tridentate, apically *semiplumbeus* (Taschenberg)
- Antennae strongly crenulate in profile beyond segment four, the segments subangular below; abdomen without rufous markings; SGP rounded or subtruncate apically 2
2. Wings fuscous; pronotum wholly black; antennal segments 5-11 elongate, widest .1-.2 the distance from the base; parameres more or less broadened apically *funereus* (Lepeletier)
- Wings subhyaline, with a fuscous marginal band; pronotum with a pale stripe along its posterior margin; antennal segments 5-11 shorter, widest about .3-.4 the distance from the base; parameres extremely long and slender *unicolor* (Smith)

***Paracyphononyx funereus* (Lepeletier)**

Anoplius funereus Lepeletier, 1845, Hist. Nat. Insectes, Hymen., III, p. 449 [Type: ♂, PENNSYLVANIA: Philadelphia (not seen by writer)].

Pompilus maurus Cresson, 1867, Trans. Amer. Ent. Soc., 1: 88 [Type: ♀, WEST VIRGINIA (ANSP, no. 414)].

Allocyphononyx maurus Ashmead, 1902, Canad. Ent., 34: 136. — Bradley, 1944, Trans. Amer. Ent. Soc., 70: 152.

Psammochares (Allocyphononyx) harpalyce Banks, 1910, Psyche, 17: 250 [Type: ♀, NORTH CAROLINA: Southern Pines, 26 July 1909 (A. H. Manee) (MCZ, no. 13, 710)].

Paracyphononyx funereus Evans, 1951, Trans. Amer. Ent. Soc., 77: 306-308.

Female. — Length 11-20 mm. Black; wings wholly fuliginous, somewhat violaceous. Pubescence mostly dark, with obscure bluish reflections, on the occiput and often also on the front grayish or somewhat glaucous. Head and propodeum with some short, dark hair; thoracic dorsum, pleura, and coxae often with sparse, short hair; abdomen setose ventrally and apically. Clypeus about twice as broad as high; malar space fairly long, nearly as long as the antennal pedicel and at least a third as long as the width of the mandibles at their base. MID varying from .51 to .58 X TFD; UID varying from .90 to 1.0 X LID; POL usually somewhat exceeding OOL; third antennal segment equal to from .7 to .9 X UID. Pronotum rather long, subangulate behind; propodeum with an abrupt, flat declivity on the posterior fourth. Ultimate tarsal segments smooth beneath, except apically. SMC3 subtriangular (fig. 24).

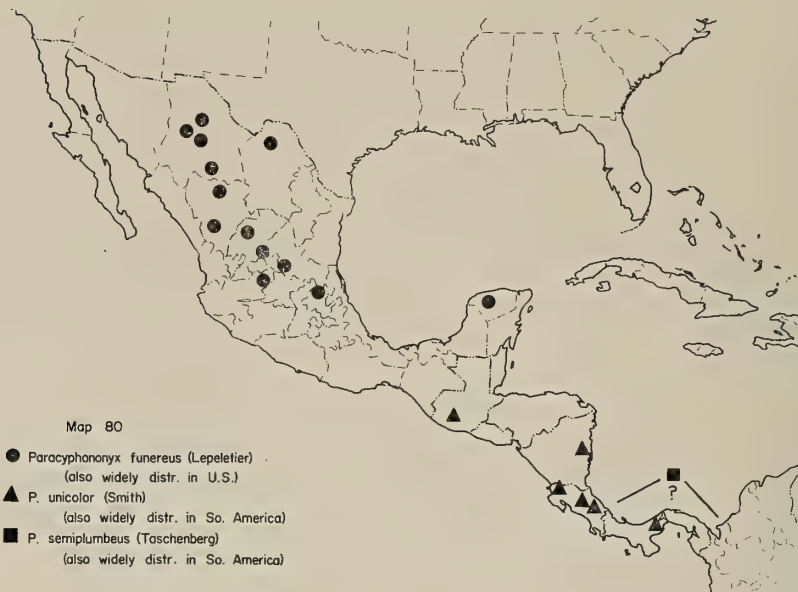
Male. — Length 8-19 mm. Black, except scape sometimes whitish below and apical tergite sometimes whitish; wings wholly infuscated, somewhat darker along the outer margin, often violaceous. Pubescence mostly dark as in the female, except grayish or somewhat silvery on the occiput, usually over much of the head, occasionally on parts of the pronotum, scutellum, pleura, coxae, and basal bands on some of the abdominal tergites; metanotum and propodeal

declivity with coarse, erect pubescence, usually dark but sometimes more or less silvery. Malar space slightly longer than in the female; inner orbits slightly diverging above, UID slightly exceeding LID; POL usually somewhat exceeding OOL. Third antennal segment 2.5-3.0 X as long as thick; segment four slightly thickened and subangulate toward the base below, segments 5-12 rather strongly so, these segments generally 1.3 to 2.0 X as long as their maximum thickness. Last segment of front tarsus slightly asymmetrical. SGP rounded or subtruncate apically, bearing some stout apical setae, internally on each side of the base with strong lateral flanges which bear setae (somewhat variable, but usually approximating fig. 249 in Evans, 1951). Genitalia also somewhat variable, but the parameres always broader apically than at their base and fringed with long setae; digiti elongate, with a median area devoid of setae (fig. 194 in Evans, 1951).

Distribution. — This species ranges from Jalisco, Yucatan, and southern Florida to Massachusetts, Michigan, and Utah. Mexican records (except Yucatan) are from the central plateau. (Map 80.)

Mexican specimens examined. — 15 ♀♀, 23 ♂♂. COAHUILA: 1 ♂, Buena Vista, Sierra del Carmen, 7 July [CIS]. CHIHUAHUA: 2 ♀♀, 6 ♂♂, Matachic & vic., 6400 feet, July-Aug. [AMNH]; 1 ♂, 18 mi. W Chihuahua, 12 Aug. 1951 (PDH) [CIS]; 3 ♀♀, 3 ♂♂, 18 mi. W Jimenez, 10 Aug. 1951 (HEE) [MCZ]; 3 ♀♀, 2 ♂♂, Santa Clara, 2 July 1947 (WG, CDM) [AMNH]; 1 ♂, 12 mi. NW Gran Morelos, 15 Aug. 1956 (RFS) [AMNH]. DURANGO: 1 ♂, 8 mi. S Canutillo, 9 Aug. 1951 (HEE) [MCZ]; 1 ♀, Palos Colorados, 8000 feet, 5 Aug. 1947 (MC) [AMNH]. ZACATECAS: 1 ♀, 1 mi. N San José de Felix, 14 July 1954 (EIS) [CIS]; 1 ♀, 2 ♂♂, 15 km. E Sombrerete, 28-31 July 1951 (HEE, PDH) [MCZ, CIS]; 1 ♀, 1 ♂, 9 mi. N Ojo Caliente, 12 May 1962 (FDP) [UCD]. JALISCO: 1 ♀, 13 mi. SW Lagos de Moreno, 4 Aug. 1954 (JWM) [CIS]. HIDALGO: 3 ♂♂, Jacala, 4500 feet, 1 Sept. 1963 (HAS) [OSU]. SAN LUIS POTOSI: 1 ♀, 1 ♂, 18 mi. SW San Luis Potosi, 7300 feet, 1 Oct. 1957 (HAS) [OSU]. YUCATAN: 1 ♀, 1 ♂, Mérida & vic., 17-25 July 1962 (HEE) [MCZ].

Variation. — The discovery of this species in Yucatan, close to sea level, came as a surprise, since it otherwise occurs in the central plateau, up to 8000 feet. Central plateau material all has reduced pale pubescence and is closely similar to material from Texas. The female from Yucatan has an unusually narrow front, while the male has a fairly extensive pattern of pale pubescence and also has the scape pale beneath and the apical tergite whitish; the parameres of



this male are more acute apically than is common in this species. All of this suggests an affinity with the eastern U. S. populations (especially Florida). It is perhaps worth noting that there is regular jet air transport between Miami and Mérida, and the specimens from Yucatan were collected within a 20 km. radius of the airport in Mérida (one, in fact, within 1 km.).

***Paracyphononyx unicolor* (Smith) new combination**

Pompilus amoenus Taschenberg, 1869, Zeitschr. Ges. Naturwiss., 34: 63-64 [Type: ♂, BRAZIL: Nova Friburg (Univ. Halle, Germany; not seen by writer)]. Preoccupied by Klug, 1834.

Pompilus unicolor Smith, 1879, Descr. N. Sp. Hymen. Brit. Mus., p. 154 [Type: ♀, GUATEMALA: Guyaquil 5000 feet (BMNH, no. 19, 696)]. — Cameron, 1893, Biol. Centr.-Amer., Hymen. II, p. 198.

Pompilus sulcatus Fox, 1897, Proc. Acad. Nat. Sci. Phila., 49: 255-256 [Type: ♀, BRAZIL: Santarem (CM)]. New synonym.

Pompilus amoenissimus Dalla Torre, 1897, Catal. Hymen., VIII, p. 272 (new name for *amoenus* Taschenberg, nec Klug). New synonym.

Pompilus monochrous Dalla Torre, 1897, ibid., p. 303 (new name for *unicolor* Smith, said to be preoccupied by Van der Linden, presumably *Aporus unicolor* Spinola 1808, Van der Linden 1827). New synonym.

Alloocyphononyx (*Atopopompilus*) *sulcatus* Banks, 1947, Bull. Mus. Comp. Zool., 99: 444.

Allocophonyx (Atopopompilus) amoenissimus Banks, 1947, *ibid.*, p. 445.

It is quite possible that other names placed by Banks in the subgenus *Atopopompilus* will be found to fall in the synonymy of this widely distributed form (e.g., *scapulatus* Brèthes, *nereine* Banks, and *alienus* Banks, all described from Argentina).

Description of type female. — Length 12.5 mm.; fore wing 8.5 mm. Black; wings lightly infuscated, darker along the outer margin. Pubescence very fine, dark except whitish on the following parts: head except upper front and vertex; scape; anterior part of prothorax; sides of scutellum; most of metanotum and extreme sides of postnotum, just behind the hind wings; propodeum at extreme base and on declivity; lower mesopleura and upper part of hind coxae; outer side of hind tibia; and weak but fairly broad basal bands on the first four tergites. Head and prothorax with weak, short setae, propodeum also with some very weak setae on the sides; tip of abdomen setose, especially below. Malar space very short, less than half as long as second antennal segment. Clypeus about twice as broad as high, weakly concave below. Front narrow, MID .53 X TFD, 1.3 X LID, .73 X height of eye; UID about equal to LID; POL:OOL about as 7:5. First four antennal segments in a ratio of about 22:7:35:32, segment three equal to .83 X UID. Vertex straight across between eye tops. Pronotum angulate behind; postnotum dorsally nearly as long as the metanotum, with the usual median constriction; propodeum with a fairly well defined declivity, its median line lightly impressed. Ultimate tarsal segments with a median row of spines beneath; longer spur of hind tibia .7 as long as the basitarsus. Fore wing with the marginal cell removed from the wing tip by 1.5 X its own length; SMC3 subtriangular, the second and third intercubital veins meeting the radius at nearly the same point.

Plesiallotype. — ♂, GUATEMALA: [San Pedro] Yepocapa [4850 feet, Dept. Chimaltenango], May 1948 (H. T. Dalmat) [USNM].

Description of plesiallotype male. — Length 8.7 mm.; fore wing 7.0 mm. Black, except as follows: palpi brown; scape with a triangular pale yellow spot below; basal half of flagellum strongly suffused with ferruginous beneath; posterior margin of pronotum with a pale yellowish stripe, narrowly interrupted medially; tibial spurs straw-colored; hind tibia with a whitish spot basally, also weakly suffused with ferruginous on the inner face; apical abdominal tergite with a large ivory spot. Pubescence pale, somewhat glaucous over most of the head, thorax, and basal parts of the legs, also forming basal pale bands on T1-3 and S1-3, T4 wholly whitish-pubescent but the sternite dark; T5 mostly dark but the following two mostly pale-pubescent. Wings very lightly infuscated, fore wing with a dark outer marginal band. Pubescence on posterior slope of propodeum very coarse, dense, and semierect, whitish in color. Malar space fairly long, about as long as the antennal pedicel and more than

half as long as the width of the mandibles at their base. Clypeus 2.3 X as wide as high, truncate below. MID .58 X TFD; UID 1.10 X LID; POL slightly exceeding OOL, the front angle of the ocellar triangle greater than a right angle. First four antennal segments in a ratio of about 15:5:17:16, segment three 2.2 X as long as its maximum width, segment nine 1.8 X as long as its maximum width; segments 5-11 distinctly subangulate beneath, widest about one-third the distance from their base. Pronotum broadly subangulate behind; postnotum as in female; propodeum sloping rather evenly from front to rear. Last segment of front tarsus slender, only very weakly asymmetrical; longer spur of hind tibia .8 the length of the basitarsus. SMC3 short-petiolate. S6 with a U-shaped apical emargination. SGP roundly elevated medially, slender, the apex narrowly rounded and beset with strong spines; base of plate only weakly expanded on the sides as compared to *funereus*. Genitalia characterized by exceeding long, slender parameres, fully twice the length of the other appendages; digiti capitate, bare in the center, mesal margin with some short, stout setae and upper outer margin with some longer setae; aedoeagus rather strongly setose (fig. 54).

Distribution. — This species apparently ranges throughout much of South America, and in Central America north to Guatemala. I have seen South American specimens from Bolivia, Argentina, and several localities in Brazil. The absence of records from northwestern South America is disconcerting, but South American specimens are strikingly like those from Central America, including the male terminalia. (Map 80.)

Central American specimens examined. — 7 ♀♀, 6 ♂♂. PANAMA: 1 ♀, Cerro Campana, 9 Apr. 1963 (CWR) [KSU]; 1 ♀, 5 mi. ESE El Valle de Anton, 2200 feet, 3 May 1952 (CWR) [KU]. COSTA RICA: 1 ♂, San José (M. Valerio) [USNM]; 1 ♀, 1 ♂, Liberia, 26-28 July 1963 (HAS) [OSU]; 2 ♀♀, 2 ♂♂, Turrialba, 22-24 July 1963 (HAS) [OSU]. NICARAGUA: 1 ♂, Sioux Plantation, Rio Grande, 10 July 1916 [MCZ]. GUATEMALA: 1 ♂, San Pedro Yepocapa, May 1948 (H. T. Dalmat) [USNM]; 2 ♀♀, Guyaquil, 5000 feet [BMNH].

Variation. — The females vary in size from 11 to 14 mm. and show considerable variation in the patterning with pale pubescence. One female from Panama has unusually strong banding on the first three tergites, the fourth is wholly pale-pubescent, the fifth partially so; while one of the Guatemala females has less pale pubescence than described for the type, as do some of the South American females examined. In the Central American females other than the type,

MID varies from .51 to .54 X TFD, antennal segment three from .85 to .90 X UID. SMC3 is short-petiolate in one Panama female.

The males vary in size from 8 to 11 mm. and show considerable variation. The Nicaragua and Costa Rica males, like some of those from Brazil, have the ferruginous coloration extending nearly to the apex of the antennae, but only in small patches on the basal third of each segment on the under side; these specimens also have the spurs more nearly whitish and a much larger whitish streak on the hind tibia, also a white spot at the apex of the front femur; in the Nicaragua specimen the hind tibia is in large part ferrugino-testaceous. The pattern of pale pubescence of the Central American males closely approaches that of the plesiallotype, but some South American males have T3 wholly pale-pubescent; these specimens have genitalia virtually identical to those from Central America, and I do not feel that Banks (1947) was correct in using this as a specific character. Actually some variation can be noted in the breadth of the parameres, but this is no greater than that occurring in *funereus* and other species of this genus. In some males POL and OOL are subequal, while in others POL considerably exceeds OOL. MID varies from .57 to .62 X TFD, antennal segment nine from 1.6 to 1.9 X as long as wide. As mentioned above, several other South American names may be found to be synonyms of *unicolor*; final solution of this will have to include a more precise understanding of the range of variation of this species in South America.

***Paracyphononyx semiplumbeus* (Taschenberg) new combination**

Pompilus semiplumbeus Taschenberg, 1869, Zeitschr. Ges. Naturwiss., 34: 66 [Type: ♀, BRAZIL: Congonh, Parana (Univ. Halle, Germany; not seen by writer)]. — Holmberg, 1881, An. Soc. Cient. Argent., 12: 138.

Pompilus iratus Smith, 1873, Ann. Mag. Nat. Hist., (4)11: 444 [Type: ♂, BRAZIL: Pará (BMNH, no. 19, 566)]. **New synonym.**

Pompilus boucardi Cameron, 1893, Biol. Centr.-Amer., Hymen. II, p. 204, pl. 11, figs. 24 & 24a [Type: ♂, PANAMA (no further data) (Boucard) (BMNH, no. 19, 704)]. **New synonym.**

Pompilus annulipes Fox, 1897, Proc. Acad. Nat. Sci. Phila., 49: 256-257 [Type: ♂, BRAZIL: Corumbá, April (CM)]. Synonymy by Banks, 1947.

Allocyphononyx semiplumbeus Banks, 1947, Bull. Mus. Comp. Zool., 99: 438 (Brazil, Argentina).

Female. — Length 12-16 mm. Head and thorax black, except the pro-

notum with a strong yellowish band along its posterior margin, the scape sometimes with a pale spot below; abdomen rufo-ferruginous except first segment black at extreme base; wings moderately infuscated, darker along outer margin. Head, thorax, basal two segments of antennae, and greater part of legs clothed in greater part with a heavy glaucous, somewhat silvery pubescence; the pubescence of the vertex, parts of the thoracic dorsum, the under side of the tibiae, and apical annuli on the tarsal segments is dark; abdomen covered with fine, pale pubescence. Temples and propleura with short, white hair; last several sternites with fine, darker hair. Labrum about 1.7 X as wide as long; clypeus about twice as broad as high; malar space about half as long as width of mandibles at their base. Front moderately broad for the genus, MID .55-.58 X TFD; UID .90-.98 X LID; ocellar triangle rather broad, POL slightly exceeding OOL; third antennal segment .95-1.05 X UID. Pronotum subangulate behind; postnotum much constricted on the midline, overhung by the median elevation of the metanotum; propodeum with a well-defined oblique declivity on the posterior third. Legs strongly spinose; ultimate tarsal segments with a median row of spines beneath. SMC3 strongly narrowed above, often subtriangular.

*Description of holotype male of boucardi.*³⁰ — Length 12 mm.; fore wing 10.3 mm. Head and thorax black, abdomen wholly rufo-ferruginous, antennal flagellum ferruginous except infuscated on upper side, more especially apically; body with yellowish-ivory markings as follows: scape beneath, posterior pronotal margin very broadly, last two tergites with large median spots, front femora with an apical spot, middle tibiae with a basal spot, hind tibiae with a long basal streak, all tarsal segments except apical ones broadly annulated basally with whitish, all spurs whitish. Wings hyaline, fore wing with a fuscous outer marginal band. Body extensively clothed with a heavy silvery pubescence, including basal two antennal segments and most of the legs, on the abdomen tending to form whitish basal bands on the basal four segments; the pubescence is dark on the vertex, the anterior part of the mesoscutum, the scutellar disc, the metapleura and sides of the propodeum; on the propodeal declivity it is coarse and erect as usual in this genus. Head, prothorax, and front coxae with rather dense, short, white hairs. [Labrum well exerted; clypeus about twice as broad as high, its apical margin weakly concave.] Malar space long, nearly half as long as the scape and about half as long as the width of the mandibles at their base. Front of moderate width, MID .58 X TFD, 1.04 X LID, .9 X HE; UID subequal to LID. Ocellar triangle broad, the front angle greater than a right angle; POL and OOL subequal. First four antennal segments in a ratio of about 23:6:32:32, segment three 2.7 X as long as thick; segments 5-12 slightly crenulate in profile, the lower margin of each arcuately swollen, the upper margin weakly concave [segments beyond nine missing in type]. Pronotum broadly arcuate behind; postnotum nearly

³⁰ A few structures which are broken or missing in the type are filled in (in brackets) from specimens from Campinas and Nova Teutonia, Brazil.

as long as metanotum; propodeum short, sloping steeply and rather evenly. Last segment of front tarsus very slightly asymmetrical. Fore wing with the third submarginal cell subtriangular. Abdomen somewhat flattened above [SGP abruptly truncate apically, its margin rather jagged, with a median projection and a pair of lateral projections, with some very stout apical spines. Genitalia with the parameres slender, elongate although shorter than in the preceding species; digiti rather slender apically, bare in the center and with some stout bristles surrounding the bare area, the bristles on the inner margin, and those at the base of the digitus, stronger and more numerous than in the preceding species, but the aedoeagus more weakly setose.]

Distribution. — This species is not uncommon in Brazil and also occurs in Argentina. The only specimen I have seen from outside these two countries is the type of *boucardi*, from Panama, but this specimen is so similar to Brazilian material that I cannot believe that it is not conspecific.

Central American specimens examined. — 1 ♂, PANAMA (no further data) (Boucard) [BMNH].

Variation. — The males from Brazil and Argentina show considerable variation, particular in coloration and in shape of the SGP, but this does not seem the place to describe this variation in detail. Some males from Brazil have the last four abdominal segments black, and there is some variation in the color of the antennae and in the width of the stripe on the pronotum. MID varies from .57 to .63 X TFD and POL frequently exceeds OOL. The SGP is always more or less truncate apically and weakly to rather strongly irregular, often tridentate as described above. The genitalia of the specimens examined show little variation of importance. The genitalia of the type are missing, so it will never be possible to check these against Brazilian specimens.

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Fig. 3. — *Aporus* (*Aporus*) *concolor* (Smith)
Fig. 4. — *Chelaporus anomalus* (Banks)
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PLATE 3

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PLATE 10

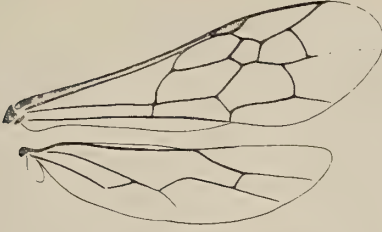
Male subgenital plates (ventral aspect)

- Fig. 63. — *Epipompilus delicatus* Turner
 Fig. 64. — *Psorthaspis vicina* (Cresson) (basal plate omitted)
 Fig. 65. — *Psorthaspis variegata* (Smith)
 Fig. 66. — *Psorthaspis connexa bugabensis* (Cameron)
 Fig. 67. — *Psorthaspis guatemalae* Bradley, plesiallotype
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 Fig. 70. — *Psorthaspis laevifrons* (Cresson)
 Fig. 71. — *Priochilus splendidulum* (Fabricius)
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 Fig. 84. — *Pompilus (Hesperopompilus) pacis* Evans, type
 Fig. 85. — *Pompilus (Ammosphex) wasbaueri* Evans, type



1. *Epipompilus excelsus* (Bradley)



2. *Aporus (Neoplaniceps) chiapanus* Evans



3. *Aporus (Aporus) concolor* (Smith)



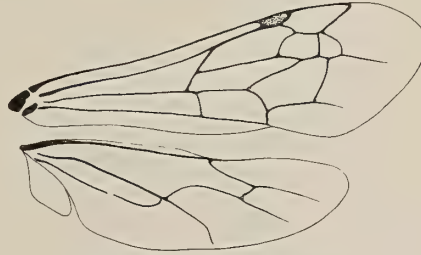
4. *Chelaporus anomalus* (Banks)



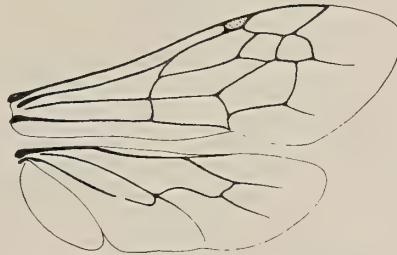
5. *Allaporus pulchellus* (Banks)



6. *Euplaniceps saussurei* (Kohl)

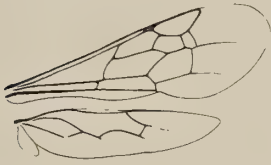


7. *Psorthaspis macronotum* (Kohl)

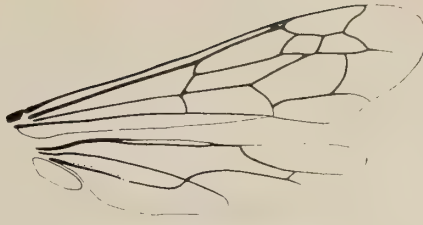


8. *Chalcochaes hirsutifemur* (Banks)

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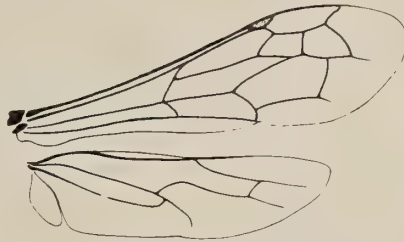
9. *Tastiolenia festiva* Evans



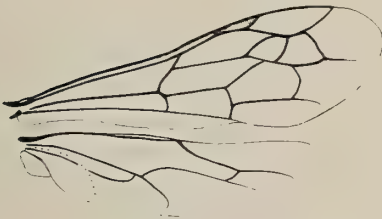
13. *Aplochaeres imitator* (Smith)



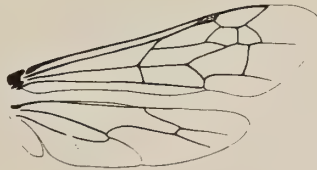
10. *Agenioideus humilis* (Cresson)



14. *Sericopompilus apicalis* (Say)



11. *Priochilus splendidulum* (Fabricius)



15. *Epsyron biguttatus* (Fabricius)

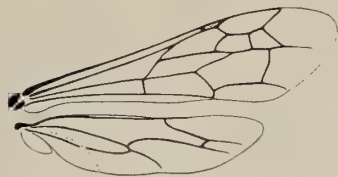


12. *Balboana auripennis* (Fabricius)



16. *Austrochaeres gastricus* Spinola

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17. *Poecilopompilus flavopictus* (Smith)



21. *Pompilus* (*Perissopompilus*) *phoenix* Evans



18. *Tachypompilus unicolor cerinus* Evans



22. *Pompilus* (*Arachnospila*) *scelestus* Cresson



19. *Anoplius* (*Arachnoproctonus*) *relativus* (Fox)



23. *Aporinellus fasciatus* (Smith)

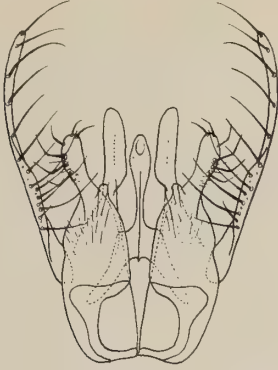


20. *Anoplius* (*Cameronoplius*) *decorus* (Cameron)

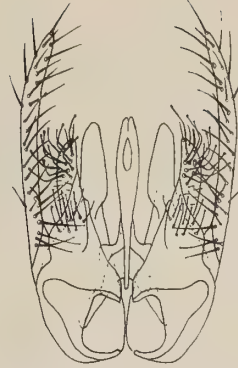


24. *Paracyphononyx funereus* (Lepelletier)

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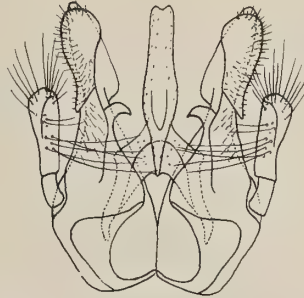
25. *Notoplaniceps innotatus* (Banks)



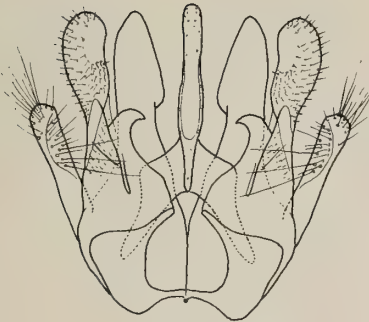
26. *Aporus (Aporus) concolor* (Smith)



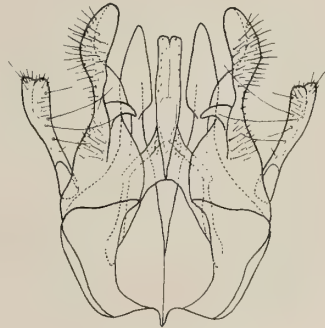
27. *A. (A.) idris* (Cameron)



28. *Psorthaspis guatemalae* Bradley



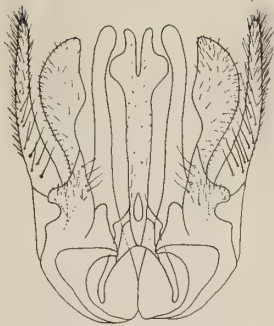
29. *P. variegata* (Smith)



30. *P. connexa bugabensis* (Cameron)



31. *Priochilus splendidulum* (Fabricius)



32. *P. scrupulum* (Fox)



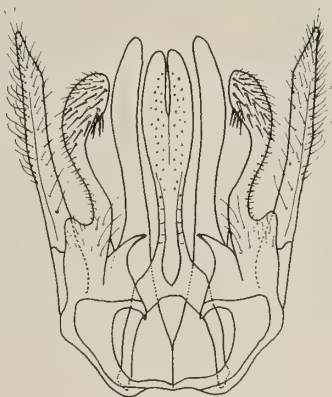
33. *P. fustiferum* Evans



34. *P. gloriosum* (Cresson)

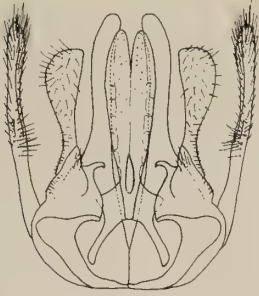


35. *P. captivum* (Fabricius)

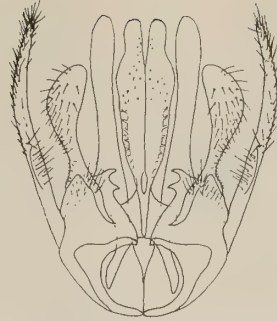


36. *P. gracile* Evans

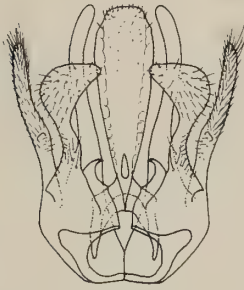
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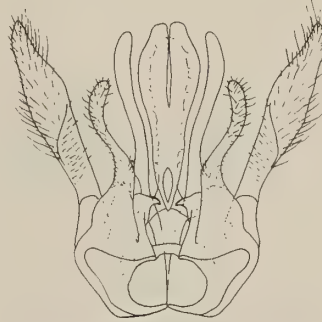
37. *Agenioideus rubicundus* Evans



38. *Austrochares mexicanus* Dreisbach



39. *Evagetes calefactus* Evans



40. *Anoplius (Cameronoplius) decorus* (Cameron)



41. *A. (Anopliodes) chiriqui* Evans



42. *A. (A.) varius* (Fabricius)



43. *A. (A.) parsonsi* (Banks)

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44. *Anoplius (Anoplius) fulgidus* (Cresson)



45. *A. (A.) simulans* (Cresson)



46. *A. (A.) simulans* (Cresson)



47. *A. (A.) papago* Banks



48. *A. (A.) alticola* (Cameron)



49. *A. (A.) dreisbachi* Evans



50. *A. (A.) toluca* (Cameron)

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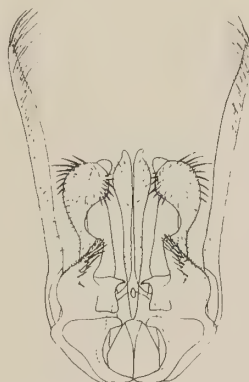
51. *Anoplus (Arachnophroctonus) echinatus* (Fox)



52. *A (A) chiapanus* Evans



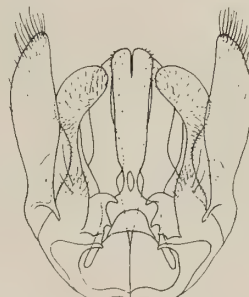
53. *A (A) cuatemoc* Evans



54. *Paracyphononyx unicolor* (Smith)

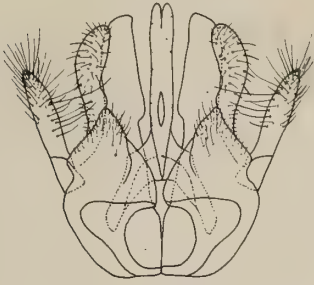


55. *Pompilus (Ammosphex) zapotecus* Cameron

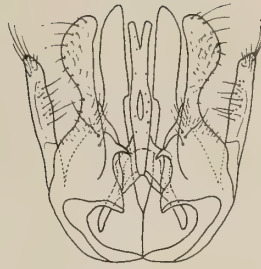


56. *Pompilus (A.) wasbaueri* Evans

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57. *Pompilus (Hesperopompilus) pacis* Evans



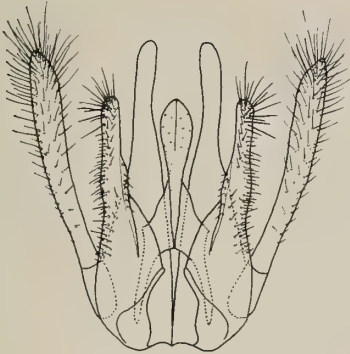
58. *P. (H.) serrano* Evans



59. *Aporus (Neoplaniceps) chiapanus* Evans



60. *Epipompilus delicatus* Turner



61. *Balboana auripennis* (Fabricius)



62. *B. cameroni* Evans

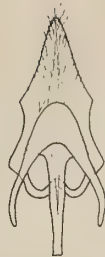
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63. *Epipompilus delicatus* Turner



64. *Psorthaspis vicina* (Cresson)



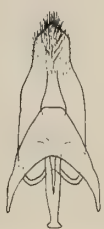
65. *Ps. variegata* (Smith)



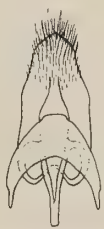
66. *Ps. connexa bugabensis*
(Cameron)



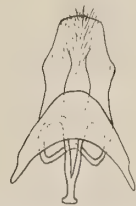
67. *Ps. guatemalae* Bradley



68. *Ps. regalis* (Smith)



69. *Ps. eubule* (Cameron)



70. *Ps. laevifrons* (Cresson)



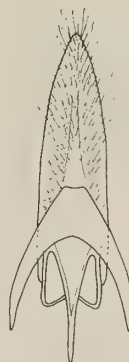
71. *Priochilus splendidulum*
(Fabricius)



72. *Pr. scrupulum* (Fox)

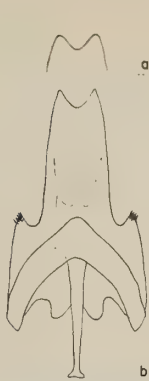


73. *Pr. captivum* (Fabricius)

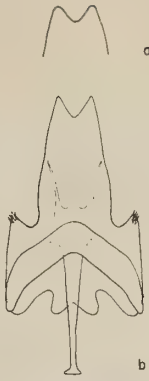


74. *Balboana cameroni*
Evans

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75. *Anoplius (Notiochares) lepidus atramentarius* (Dahlbom)



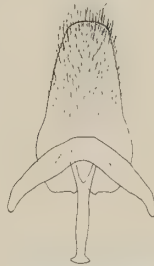
76. *A. (N.) lepidus lepidus* (Say)



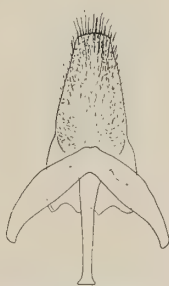
77. *A. (N.) amethystinus* (Fabricius)



78. *Evageles calefactus* Evans



79. *Anoplius (Anoplius) simulans* (Cresson)



80. *A. (A.) alticola* (Cameron)



81. *A. (A.) pagago* Banks



2. *A. (Arachnoproctonus) cuatremoc* Evans



83. *Pompilus (Hesperopompilus) serrano* Evans



84. *P. (H.) pacis* Evans



85. *P. (Ammosphex) wasbaueri* Evans

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